SHOUT
SHARE
IT

A.36.

THE
ENTOMOLOGISTS' BULLETIN

PRESENTED

THE JOURNAL OF
THE AMATEUR ENTOMOLOGISTS' SOCIETY

VOL. 2 No. 14 PRICE SIXPENCE February 1937

BRITISH MUSEUM (NAT. HIST.) DEPARTMENT OF ENTOMOLOGY

CONTENTS

TITLE	AUTHOR	PAGE
General Remarks	Eds.	2
Editorial, Balance sheet, etc.	Eds.	3
Swarm of larvae in the Lake District	B.A.C.	5
As light as a butterfly's wing		5
Butterflies of the Stroud District, Glos.	T. B. Fletcher	6
Wing-prints of lepidoptera	A.L. Capener	7
On the insect trail	L.R. Tesch	8
	R.K.	10
An exploded wireless idea	Nol. Head	11
Query No. 26	Capt T. Dannreuther	11
No. 27	F.J. Clarke	12
No. 28	B.A.C.	12
Replies to Queries: No. 23	B.A.C.	12
No. 1[illegible]	T.B. Fletcher	12
Wants and Exchanges		13
Membership changes		13
Calendar	B.A.C.	14
Death ray to kill grain pests	B.A.C.	14
The last rose of summer	B.A.C.	14
Errata		2

The next Bulletin, No. 15, we hope to post off during mid or late March.

COMMITTEE

HON. SECRETARIES AND EDITORS:-

B.A. COOPER
61 Okehampton Road,
London, N.W.10

A.N. BRANGHAM
160 Haverstock Hill,
London, N.W.3.

Published by the Society in London

THE ENTOMOLOGISTS' BULLETIN

is published by the AMATEUR ENTOMOLOGISTS' SOCIETY nine times per year.

The annual subsciption to the society, which includes the year's Bulletins, is :-

Great Britain, Empire, and U.S.A.....3/6 post free
Other countries.....................5/- post free

This should be sent to the Hon. Treasurer, B.A.Cooper, at 61, Okehampton Road, London, N.W.10.

The subscription becomes due on January 1st, and members are requested to forward it as soon as possible to save trouble. The Amateur Entomologists' Society is at liberty to discontinue the sending of its publications to any defaulters after a period of grace of three months (i.e., after March 31st), so may we remind forgetful members to make a note of this in their diary lest they should find themselves accidentally cut off.

The Hon. Secretaries will be pleased to forward a free specimen copy of the Society's journal and a prospectus to anyone likely to be interested, on receipt of name and address. They will also gladly send prospectuses to those members who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage.

The exchange column is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting many years are advised to confine themselves to the exchange of ideas, apparatus, and live insects, leaving that of set, pinned, and unpinned specimens till they have had more experience. It may be added that the Editors offer no guarantee for any articles offered herein, and they are in no way to be held responsible should the priviledge allowed be abused.

Anyone at present not recording migrant lepidoptera who would care to note down and report anything connected with this subject that he might observe should write to B.A.Cooper for free literature and information.

If there are any members living abroad or in the provinces who are in the unfortunate position of not always being able to get the book they desire, we shall be glad to order it for them, postage being extra.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

welcomes any one interested in any branch of entomology, and especially sets out to encourage the beginner.

oOo
oOoOoOo
oOo

We enjoy a thicker Bulletin
Do YOU, our members, too ?
Then help to swell our numbers
Help fill our pages through.

ERRATA: P. 7. Line 54. Those requiring specimen wax pencils should write, enclosing stamp, to B.A.Cooper.
P. 12. Line 19. After "Swallowtail" insert, "Papilio podalirus (Scarce Swallowtail).

oOo

THE ENTOMOLOGISTS' BULLETIN

(FORMERLY THE JOURNAL OF THE ENTOMOLOGICAL EXCHANGE AND CORRESPONDENCE CLUB)

VOL. 11 No. 14

February 1937

HON. EDITORS:-
B.A.COOPER
A.N.BRANGHAM

HON.TYPIST;-
A.GLANFIELD

Entomology as a serious hobby dates back as far as the eighteenth century, the science growing up alongside in mutual combination. Clubs and societies early began to appear and it was not many years later that the first entomological magazine commenced publication. With the scientific revival after the Great Exhibition the numbers of followers of the hobby made great leaps forward and natural history societies sprung up all over the country. Meanwhile, economic entomology had made its appearance, and, together with other advances, magazines began to take on a more technical form. Enthusiasts tended by now to become divided into two distinct classes - the entomologist who considered himself a biologist, and he whose chief purpose was the joy of collecting. The two managed to get along very well together, however, till, shall we say, soon after the end of the Great War. More collectors ceased to become more numerous with the growing popularity of other outdoor recreations, while scientists tended to increase. Consequently societies and magazines lost some of their popular attraction and it became increasingly difficult for tyros and beginners to obtain companionship and information as to events in their pet hobby.

It was this state of affairs that led our energetic founder, L.R.Tesch, to the conclusion that if he could inaugurate a club to unite these followers of the net he would serve a useful purpose, not only in stimulating their interest in the subject, but possibly also in encouraging newcomers into the brotherhood of the net. It is generally agreed that many youngsters lose interest, not, as the aged would have it, through advancing years and diminishing spare time, but rather through the absence of fellowship with others of similar tastes.

Accordingly, to fill this want, Mr Tesch, soon after midsummer 1935 started his attempts to found a correspondence club or magazine which would deal with those elementary matters that our more technical relations did not, and, in fact, could not, supply. Thus the Entomological Exchange and Correspondence Club came into being.

Response, though not quite as expected, was not lacking and we grew slowly but surely, mainly by advertisement in the Exchange and Mart and the recommendation of members. A number of public and secondary schools were circularised, but not one reply was received. This was rather a premature setback as it was in this direction we had hoped to gain the greater number of our adherents. However, we intend to try this method again later in the coming year. One or two experienced entomologists circularised have kindly handed on our prospectuses to enthusiastic beginners of their acquaintance, while a few more have themselves joined. In December 1935 our membership had reached 20, by May it was 37, and at the end of 1936 we had become 53 - strong.

Our first Journal, of three pages, appeared in August 1935. The first five journals had a total of 21 pages, many incomplete. Journals six to nine contributed a further 31 pages, while the last four journals of Vol I totalled another 37½ pages. The Editors have guaranteed to supply articles enough to make each journal during the coming year of a length of at least eight pages. It is hoped that members will do their best to enable this bare minimum to be greatly exceeded.

In June last the society suffered a great loss by the resignation of its founder and moving spirit - L.R.Tesch. When the present Secretaries had arranged to take over his duties it was decided to learn the views of members on a number of changes which they proposed to make. Accordingly ballot forms were sent out with Journal 10 putting these matters to the vote. These were returned with many useful suggestions by our more enthusiastic supporters and as a result a few rules were drawn up (see present cover) and other changes came into force.

The most conspicuous decision was the change of name to "The Amateur Entomologists' Society" and that of the Journal to "The Entomologists' Bulletin". It was also decided that henceforward the Society's journal should be duplicated instead of hectographed, as previously, while the subscription was fixed at 3/6 per calendar year.

It was at this time that the Society decided to do what it could to help S.E.U.S.S. in their endeavour to throw light on the factors governing the migration of insects. It was very late in the year to commence such a project., but we hope that we may be of more use in this direction during succeeding years. There we should like to offer our thanks to Captain Dannreuther for the help and useful suggestions he has so freely given.

The Society for British Entomology has offered to send us their Journal in exchange for our own publications. We are therefore to commence the formation of a library. Further details on this subject will appear in a later issue.

The Editors would like to hear from a third member with a view to the formation of an Editorial Committee. At present one or two periods in the year occur when they are unable to put their full attentions towards the Society's business - both secretarial and editorial - and they hope that the difficulty may thereby be alleviated.

The suggestion has been made that we should produce a year-book at the commencement of each season. This would contain a list of members and addresses, statement of accounts, rules, and record of the doings of the Society during the past year. It is my suggestion that if printed this would help to give the Society a recognised standing; in this case articles of more than passing importance might be included with it as make-weight. Again, for the benefit of new members and for easy reference, queries and replies might be printed in a separate booklet with the reminder that few replies are complete and practically all could be augmented considerably.

May we once more impress upon our readers that we do no want to be looked upon merely as editors of a magazine, but as participants in a society existing for the benefit of its members. It is for all members to enter into the spirit of the Society and do their utmost towards helping one another. Should they consider any aspect of our organisation to be unsatisfactory or if they can offer suggestions for improvement, it is their duty to write to us - we ar always prepared for the worst! Perhaps many of our younger members are not quite sure what kind of information they require - that is why we are always pleased to have as much correspondence and article as possible from those with more experience.

It will be seen from the above that we are out to do ou best for the beginner and the tyro. If we succeed in retaining the interest of some whose liking for entomology would otherwise have faded away, if we succeed in causing some among us to take a deeper and more scientific interest in the objects of their present fancy, if we succeed in building up new friendships between our members, w shall consider our work to have not been in vain.

And what may the future hold in store for us? We do no think it unreasonable to hold hopes of reaching the century mark by the end of another season. But for how long our members will contin to increase it is impossible to forsee. Beginners do not always remain beginners and many will no doubt gradate at some time or another to the higher entomological magazines. A few will, we expec, for long remain in the Society and continue to contribute notes to our columns, exchange their duplicates through us, and find our matter worthy of their subscription.

We will finish by thanking all those who have written us letters, contributed notes. Queries, replies and exchange notices, who have introduced us to newcomers, and last, but not least to those who have helped to swell the coffers by way of donations.

Statement of Accounts - June 1935 - December 31st 1936.

INCOME.	
Up to July 31st;-	
30 @ 3/-	£4:10:0
1 @ 2/6	2:6
2 @ 4/-	8:0
	£5: 0:6
Aug 1 - Dec 31st:-	
1 @ 2/6	2:6
1 @ 3/-	3:0
18 @ 3/6	£2: 2:0
2 @ $1 = 3/10	7:8
2 @ 4/-	8:0
Donations (4 persons)	10:6
Single copies of Journal (6d ea)	3:0
Price of B M booklet	9
	£8:17:11

EXPENDITURE.	
Total expenditure up to Journal 9	£3: 5: 4
Journal 10	14: 5
Journal 11	19: 8
Journal 12	13: 7½
Journal 13	15:11
Prospectuses (250)	7: 6
Rubber stamp (With Editors Compliments)	3: 0
Advert (Exchange & Mart)	3: 2½
B M (N H) booklet	9
Sundries (receipt book)	6½
Balance carried forward...	£1:13:11½
	£8:17:11

It will be seen that this balance is insufficient if we are to carry out our hopes of enlarging the Bulletin and providing a cover. In addition, all postage on free copies and letters to defaulters, prospective and present members has in the past been paid by the Secretaries, but in future this will be recorded in the accounts, though, of course, they will continue themselves to make up any deficit which may thus be shown up. It is therefore essential that we shall this season increase our membership in order to be able to fulfil the above proposals.

B.A.COOPER.
A.N.BRANGHAM.
Hon.Secretaries & Editors.

oOo

SWARM OF LARVAE IN THE LAKE DISTRICT

Referring to our note on page 10 of journal 11 with this title, the following has since come to hand (Kindly forwarded by Captain T.Dannreuther).

F.H.Day, F.R.E.S; the Recorder for Cumberland, knows nothing of the occurrence mentioned in the Daily Herald, but gives it as his opinion that the larvae concerned would no doubt be those of C.graminis (Antler Moth), as suggested.

R.A.Harper Gray, Advisory Entomologist, Armstrong College, Newcastle-upon-Tyne, writes as follows:-

"I have not examined the above area" (i.e.High Pike), "but on 2nd July I made a careful examination of Kentmere Pike" (roughly twenty miles away, as the crow flies, but surroundings similar),"and I can say definitely that the caterpillars were those of the Antler Moth, Charaeas graminis, many of which I collected and bred out in my insectary here. In regard to this particular area, I came to the conclusion that the reports were somewhat exaggerated though, of course considerable damage was being done by the pest and indirectly by birds (Seagulls, Starlings, etc). There were also many pupae at a height of about 2,000 feet. I, therefore, think that the suggestion of the Entomologists' Correspondence Club as regards identification is right". It was added that he certainly did not think the caterpillars referred to in the Daily Herald were those of P.gamma, as had been suggested by others.

B.A.C.

AS LIGHT AS A BUTTERFLYS WING.....

A certain member (who shall remain anonymous lest objections be raised) has expressed a desire for paragraphs in a somewhat lighter vein to appear occasionally. The following is for his especial benefit, but here g -

Two countrymen bought a watch. It went satisfactorily until one day it stopped. They took it to pieces and found a dead fly inside. "What else c'd y'expect, Jarge?" said one,' "whoi, lookee, th'engine driver be dead !"

Butterflies of the Stroud District, Gloucestershire.

Of the 68 species of Butterflies on the British List, ten are merely casual visitors from the Continent, or are extinct. Of the remaining 58 at least 40 occur within a 5-mile radius of Stroud and another five species are obtainable in localities easily accessible from Stroud. I doubt whether any other district in England can offer a local list of Butterflies containing more than 45 species normally found there and excluding casual visitors.

Of the Fritillaries, Argynnis paphia (Silver-washed), A.aglaia (Dark Green) and A.euphrosyne (Pearl-bordered) are common almost everywhere, but A.adippe (High Brown) and A.selene (Small Pearl-bordered) are more local, occurring in or near some woods, and Melitaea aurinia (Greasy) is very local, although odd specimens sometimes wander quite a distance. Of the Vanessids, Vanessa c-album (Comma) occurs in small numbers every year, V.urticae (Small Tortoiseshell) is, of course, abundant, V.io (Peacock) and V.Atalanta (Red Admiral) are usually common, and V.cardui (Painted Lady) is fairly common in most years. Limenitis camilla (Sibylla: White Admiral) used to be almost unknown in Gloucestershire but has penetrated into the District in the last three years. For Apatura iris (Purple Emperor) the collector must go across the Severn to the Forest of Dean. Of the Satyrids we do not, of course, find the three Northern species but we have all the other eight. Melanargia galathea (Marbled White) is abundant over rough grass in July; Parage aegeria (Speckled Wood), P.megera (Wall), Epinephele jamira (Meadow Brown), E.hyperanthus (Ringlet) and Caenonympha pamphilus (Small Heath) are all abundant; Satyrus semele (Grayling) is very local, but abundant where it occurs, but the collector will have to go some little distance to find E.Tithonus (Large Heath), which curiously enough, is not at all common in Gloucestershire. Nemeobius lucina Duke of Burgundy Fritillary), so called, but no relation of the true Fritillaries, is generally common near woods in May but is rather local.

Of the Hairstreaks we do not find Thecla pruni (Black) or T.betulae (Brown), although the absence of the latter is rather a mystery, as there is plenty of its foodplant (Sloe) and the country seems suitable for it. Callophrys rubi (Green) is abundant, T.w-album (White-letter) is quite common, but T.quercus (Purple) is only found in outlying parts of the District.

Of the Blues Lycaena minima (Small), L.medon (Brown Argus), L.argiolus (Holly), L.corydon (Chalk-hill), L.bellargus (Adonis), L.icarus (Common) are all plentiful; for L.aegon (Silver-studded) there are few suitable places and the collector will have to go beyond the 5-mile radius; L.arion (Large) is very local and exterminated by over-collecting in several old localities.

Owing to lack of clover-fields Colias croceus (Clouded Yellow is never common but a few turn up in most years. Of the 'Whites' Gonepteryx rhamni (Brimstone), Euchloe cardamines (Orange-tip), Pieris napi (Green-veined), P.rapae (Small Cabbage) and P.brassicae (Large Cabbage) are all abundant in suitable places, whilst Leptosia sinapis (Wood) occurs occasionally near Stroud and is foun regularly and commonly in several localities at no great distance. Aporia crataegi (Black-veined) used to occur in the district not long ago but must now be reckoned as extinct here, and Colias hyale (Pale Clouded Yellow) can only be included amongst our casual visit

Of the eight British Skippers no less than four are absentee from the Stroud District, although Pamphila comma (Silver-spotted) is said to have been found in Rodborough Hill, but certainly I have never come across it. The four species that we do find-- Pamphila thaumas (Small), P.sylvestris (sylvanus : Large), Hesperia malvae (Grizzled) and Nisoniades tages (Dingy) -are all abundant.

One does not look on such species as M.galathea, L.corydon and L.bellargus as Garden Butterflies, but they are so with me. So far, 28 species have been noted in my garden here and six more have been found in the adjacent Common, and doubtless some of thes may come 'over the garden wall' at times.

Rodborough,
near Stroud, Glos.
9.12.36.

T.BAINBRIGGE. FLETCHER.

WING PRINTS OF LEPIDOPTERA.

In the early days of the Club I contributed a few notes on a very effective method of making permanent prints of the wings of Lepidoptera. Mr Cooper thinks it would be of interest to members if I enlarge somewhat on this, especially if they could *see* the prints themselves. Each member will therefore receive with this issue a mounted print of one of our butterflies or moths.

In the first place, I would point out that not all species make really good prints, and even in the same species, one cannot expect to get equally good results, especially in a ''mass production'' effort like this! But, I think in all cases it will be found that they are true examples of their particular species.

HOW TO MAKE THEM. Since my last notes our numbers are practically trebled, so for the benefit of new members I will again explain how to make the prints. All you need to buy is a supply of Waxed paper. Cut this up roughly to the sizes required. Lay a piece of the paper on a sheet of glass or glazed tile, and having carefully removed the wings as close to the body as possible, arrange them on the waxed paper. Cover with another piece, taking care not to remove the wings. Over this lay a piece of fairly hard smooth paper, and with the bowl of a spoon or other hard rounded object, rub evenly all over. When you think you have rubbed enough, lift up a corner and separate the waxed papers. If the scales are adhering to the paper uniformly, the job is done, if not rub a little more. Then sepaparate the papers and remove the wing membrane.

It will be found that practically all the scales have become embedded in the wax of the paper, leaving a perfect impression of the wing. In most cases the veins show up remarkably well, and in the case of foreign species this may be a great help towards classification. It should be noted that the print should be examined by looking *through* the paper. It is a little more dull on this side, it is true, but on the scale side there is usually an iridescence which gives a false idea of the insect. Prints should therefore be mounted with the scales in contact with the mounting surface.

MOUNTING. I have only just discovered a really good method of mounting the finished prints. Previously I had fixed them in position by means of gummed paper braces, but they are apt to slip out. Paste and gum were useless on account of the waxy nature of the paper. I asked several people how I could stick them down, but none had any useful suggestion to offer. It was only when considering how I could mount the prints as specimens for the members that I realised how it could be done --- then I wondered why I had not thought of it before. Wax ! That, I think is the only effective method. Rub some wax on the mounting surface in the position to be occupied by the print, place the print in position, cover with a piece of paper and repeat the rubbing process. Result --- the print "stays put", but can easily be removed if necessary (though I don't advise it as some of the scales will be lost.) I found it rather awkward rubbing with a piece of beeswax so made a number of pencils ---- Elder twigs, with the pith removed, and filled with beeswax to which had been added a small proportion of parafin wax, to render it less brittle. If any member wants one of these --- while they last --- just send stamp to cover postage.

GENERAL REMARKS. It is as well to adopt a number of definite sizes for the finished prints, this helps to make the collection neat and uniform. My own method is to draw rectangles in about seven different sizes on a piece of paper and place it under a sheet of glass. Placing the two parts (one above the other) in position in the selected rectangle, it is a simple matter to trim them to size with a razor blade and steel rule. These pencilled oblongs are also useful in centring the prints when mounting.

It is a matter of taste whether they are mounted in loose-leaf books or a kind of card index system.

The best paper I have yet used is "Best Thin Waxed Tissue" sold in sheets 20" x 30" @ 8d. per Quire, by Messrs. Kettle of Holborn, London. Anyway *don't* use Greaseproof. I have seen some done on this, and while they are quite good on the *wrong* side, the impression is much too dull when looking through the paper.

As to the time taken in preparing each – I should say it takes from six to eight minutes to make a print and mount the specimen with wax. Writing-up is ad. lib. Some persons might possibly do the job quicker while others would take twice as long. Size of specimen also makes a big difference. Small ones are easy so long as one doesn't "blow" before they are covered! The bigger they are the longer they take.

Wing Prints have great possibilities, especially in the study of variations and comparison of species, and a collection of allied species from all quarters of the world would be most interesting and illuminating. One great point in their favour is that they can be sorted and stored in hundreds, be easy of access and take up little room; also they are not likely to be damaged in transit. Each should be fully "written up" with as complete an account as possible of its life history, tendency to variation, and anything affecting frequency or otherwise of its occurrence. Those who stick to English species can make their own reference book, and find joy in the doing, for even the Tineae come out in detail.

A.L.CAPENER.

ON THE INSECT TRAIL.

A bug-hunting expedition is not invariably the carefree jaunt associated with our English woods and commons, and it can provide thrills enough to satisfy the most ardent enthusiast. Let me bear you across the seas to those lands where insect life is at its height, and where all orders teem to a degree inconceivable to those who have not actually experienced it.

Our magic carpet, then, leaves these shores and passing over cities, seas, and deserts, hovers above a land of palms, swamps, and apparently limitless bush -- West Africa! Descending, it brings into view a hilltop emerging from the forest, whereon is perched a solitary bungalow. We are decanted at the bamboo ladder leadind up to this. ("Why isn't it built on the ground?" you ask. "Snakes, my friend, snakes!") Inside, we repose on the battered remnants of chairs and watch a collector preparing for the fray.

There are the usual satchel, net, killing bottle, pillboxes, and other oddments of our craft, and, in addition, a sharp knife is attached to his belt ("Just in case of anything" he tells us with a smile.) A spine pad to protect the vital spot at the back of the neck, a sun helmet, a pair of thick leather leggings, and a phial of double strength ammonia. The last two are again necessitated by snakes, the former as a protection, and the latter, in conjunction with the knife, in the disastrous event of a bite.

Let us then gird our loins similarly, and taking our imaginary nets, follow down the crazy ladder, out on the bare hill top, and into a veritable tunnel of closely matted greenery which passes down the slope to the bush path below. Nets must be held close to the body here, or they will be ripped to shreds before we start. Already perspiration is pouring from us, as we move through this natural hothouse in a temperature of anything up to 120 degrees.

In a few minutes we debouch on to a wider, but hardly less stifling trail, standing aside while a long procession of natives clad in little more than beads and a smile, amble onwards to some hidden village. Two lizards, brilliantly green, scuttle away in front of us. We look up in alarm as a sudden crashing in the branches overhead sounds through the silence. ("Monkeys" says our guide. "Look out!"). A sweep of the net, and a gorgeous Long Tailed Blue is taken. Allowing our attention to be distracted, we miss two Swallow Tails which come sailing past, and strike wildly at the African equivalent of our Orange Tip. Fast and furious is the game from now on. There are never less than half a dozen in view at one time, and our storebox, strapped to our chest is already getting well tenante

The trail gradually widens, and now and again we pass over clearing, swampy in parts; this damp, sandy soil is beloved of many species, and we net a dozen in half as many minutes.

Suddenly our guide , who has fallen behind slightly, gives us a resounding slap on the cheek from the rear. Wheeling round in startled amazement, we see him holding between his finger and thumb that curse of the tropics, the tse-tse fly. In many regions the carrier of the dread sleepy-sickness, in our hunting ground it is only a nuisance, but a very keen one at that, and the golden rule of "see and slap" is invariably carried out. In appearance it is very similar to the ordinary housefly, but slightly larger, and may always be known by its habit of carrying its wings, one exactly above the other, and not V-shaped as in the case of its English brother.

Having recovered, we move on to slightly higher ground, where the bush is less dense, and we are at once puzzled by the appearance of irregular, cone-shaped hills, whose tops, in a series of spikes, can be seen above the vegetation. ("Ant-hills" we are informed.) With the temerity of the innocent, we break off the top of one of these spikes with a boulder. It is about three inches through, and hollow. We don't wait to investigate farther, for hordes of the ferocious "soldier-ants" come streaming out of the aperture to attack the intruder. These may be as much as an inch in length, and - believe it or not - can incise a neat little semi-circle in one's flesh of a good eighth inch diameter. One hill such as we imprudently opened, contains countless thousands so that we have immediate business in another direction.

The bush is now a little more open, with isolated taller clumps here and there, and we are introduced to what I consider - apart from possibly more brilliant colouration - is the main characteristic differentiating these exotic lepidoptera from our own, namely, swiftness of flight. Keeping more or less to the tops of these clumps, but with occasional lightning swoops earthwards are species somewhat akin to our own Vanessas, but considerably larger and with exceptionally strong nervures. Their wings, too, are rather more deeply dentated, with a total span of some four to five inches. With incredible speed they flash round and about us, and it requires extreme skill, with a great element of luck, to net them.

With them, Too, are large editions of our Yellow Underwings and a few Hawks, very similar to those we know. Perspiring, and parches with thirst, we take such as we can of these, and pause to watch our guide in full cry after a gorgeous red, yellow and black insect, as it darts down the trail. In the chase his sun-helmet falls off. (Who bothers about a lost hat in an English meadow?.) But that prize is gone; the helmet must be resumed without a moment's delay. Even the briefest exposure of the white skull to the African sun may mean disaster.

It is now time to turn homewards by a different route, and netting as we go, staying to watch the wonders of an ant "safari" - a living rope of ants across the trail about two inches thick, all intent on some maraudind expedition, and guarded on either flank by a perfect line of soldier-ants as they march we see several shimmering pearly-blue butterflies twenty yards ahead. We dash after them, and they make for an isolated group of palms a short way off the track. There appears to be no reason why we should not take them, as they are not flying over fast, when a warning "Stop!" from our guide halts us dead on the trees. Coming up, he points to the foot of one of the palms. There we see a piece of wood about a foot long, bound round with some red rags, a few feathers stuck into it, and some twisted palm leaves to make up the oddity. In front of it are the remains of a disembowelled chicken. "Ju-Ju", he says. This is a native fetish-grove, sacred to the gods who held sway in thes lands long ere Europeans ever heard of them. No white man may pass that grove. Round it, if you will, but not through it. The red-ragged guardian bars the way. (Yes, you may laugh, my masters, but strange things have been known to happen to violators of African ju-jus. No old hand would ever do it). So the pearly-blues winged their way out of danger into sanctuary, perhaps, who knows, with a sly twinkle in their eyes as they went.

The afternoon is now wearing on, and the bush is beginning to resound to the shrill song of the cicadas, like the glorified chirruping of millions of crickets, while isolated attacks indicate that the mosquitoes are preparing for their evening meal. For a short distance our path leads alongside a river in which two logs are floating. We stop for a moment to box a praying mantis, which we observe in its hypocrital attitude of reverence, and while we marvel at its almost exact resemblance to the leaf on which we found it, there is a stir in the long grass at the water's edge, a dozen yards ahead. With a wicked gleam in one yellow little eye, ten feet of first-grade crocodile lumbers clumsily into the water towards the aforementioned "logs". Three tails swirl as one - and the river is empty, save for ripples.

Through a gap in the bush we see our bungalow on its hilltop, and wearily climbing to its shelter, with what mental energy is left us we gloat over the varied contents of our boxes. Butterflies, moths, iridescent beetles, mantids, mud-wasps, soldier ants, many representatives of the myriad family of the Homoptera and miscellaneous others testify to our efforts in that unchatted forest.

Generally speaking, tropical lepidoptera caught with the net in as good a condition as ours, owing to the density of the bush in which they make their home. Ragged wings are all too frequently the case, and it is rare to take a really perfect specimen - at least such is my experience. Their enormous number, however, makes up for thatm and by dint of hard work a really good collection can be obtained.

From the very sketchy outline I have given of an average two hours trip, it will be seen that bug-hunting in Africa is not at all events, monotonous, and it can be very much the reverse. In some ways, it is perhaps more restricted than at home, as once an insect has deviated from the trail or clearing in which it is seen, it may be generally given up as lost. It is distinctly inadvisable to go plunging into the scrub after it, as one does here. Deadly tree-mambas and other snakes await the foolhardy enthusiast, there is always the remote chance of alighting square on a sleeping leopard with her cubs, while it must not be forgotten that the merest scratch from a thorn - and some of these are an inch long, curved, and needle sharp - will, in a tropical climate, set up blood poisoning and keep the recipient in painful memory of his exploit for days.

Sugaring I never found very successful, though I must admit I did very little of this. The bush at night is not always the most desirable of spots.

Light, on the other hand, can be remarkably good, and one's bungalow on a good night - and most nights when the moon is down are good out there - is a sight to make any collector's heart beat quickly. But, beware of light when the flying ants are out! In their millions will they come and shed their wings in every corner of your home, putting out your light, carpeting your floor, swamping your food and generally making life impossible.

But our magic carpet waits. We must bid farewell to that entomological Paradise and return to the smoke and cities of our prosaic civilisation. One thing I can say, thatwere it not for the sordid needs of this life, and the provision of the wherewithal to find them, snakes, fever, crocs, "skeeters" and all the other pests notwithstanding, I would return to the bush tomorrow, if only for the sheer joy of setting out once more on the insect trail.

L.R.Tesch.

"Do you know the pile-built village, where the sago-dwellers trade?
Do you know the reek of fish and wet bamboo?
Do you know the steaming stillness of the orchid scented glade
Where the blazoned bird-wing butterflies flap through?
It is there that I am going, with my camphor, net and boxes,
To a gentle yellow pirate that I know,
To my little wailing lemurs, to my palms and flying foxes,
For the Red Gods call me out and I MUST go."

R.K.

(From "In Days Agone" by W.S.Blatchley, LL.D.)

oOo

"AN EXPLODED WIRELESS IDEA".

Twelve years ago a youthful butterfly and moth student first conceived the idea that female moths and butterflies were expert broadcasters, and that male insects were receivers of their messages; their instruments being their hornlike feelers. The publication of this amazing suggestion, roused a nice ado, for true scientists need a more solid foundation than idle cursory assumption.

That master naturalist of France, Henri Fabre, wasted no time on theories, but experimented thus.

Taking a newly emerged female of the Emperor Moth, he removed its feelers, and placed it to dry its wings upon a chair in his study. In the afternoon he caged the female and took her right away. Opening the study window he watched the chair , and soon males arrived, swarmed over the chair, and were obviously puzzled that the female they had "scented" was absent. This was one only of the experiments which all exploded the wireless theory.

The world has moved twelve years nearer to wireless perfection since then, and listening-in is part of everyday existence even in the remotest quarters of the globe.

Many who refuted the idea of wireless instinct in insects, have passed on. Fabre's books remain with their sure and undeniable facts on the question; yet listeners-in were told recently by another young enthusiast that he had observed the vibrating feelers of a female moth, and when a male arrived, he was convinced that she had wirelessed for him. Fallacies idly disseminated thus, are harmful to natural history students.

Mr. Head, the owner and creator of the first and largest butterfly farm in the world, has had over fifty years' experience. The following are his observations.

He followed a Fox Moth male evidently looking for a mate. It soon alighted in the heather and Mr. Head found it had"scented" the female, but she had been dead for some time, so had not sent a message by feelers-vibration.

Mr. Head placed some female "Scalloped Hazel" moths in a small cage, which he placed in a moth-trap. The next morning he had all the males he wanted for stock, and he removed the females, and emptied the trap, releasing all not wanted. A"year" afterwards he placed the same cage in the moth-trap, with females of the "Muslin" moth in it. Insects do not assemble to other kinds of insects, but the next morning to his surprise, after the long lapse of time, Mr.Head found all the male muslin moths he required, and several male "Scalloped Hazel" moths, evidently attracted by the scent left a year before, by a former generation.

A last instance to confound a fallacy, is this. A female clothes" moth, that bugbear of house-wives, had crawled from its cocoon in an outhouse. Mr Head immediately crushed it almost to pulp. In a short time, he called me to see male moths in dozens crowding through the door and window and swarming round the "corpse".

One can live a century and only learn an infinitesmal part of nature's wonders, but it is best to be sure of the little one can prove, than place on record fallàcies that may prove a stumbling block for future naturalists.

Nol Head.

cOo

QUERIES

No. 26. - Captain.T.Dannreuther has sent us the following six questions relating to that notorious migrant *Plusia gamma* (Silver Y moth) :-

(a) What is the period of time spent by this insect, after emergence from the pupa, before egg-laying can take place? If variable, what influences have any effect on the variation?

(b) How long is this insect in the pupal stage (same qualifications as above) ?

(c) At what time of day does the Silver Y emerge from the chrysalis? Again, if variable, when do the numbers appear to reach a maximum, and what weather conditions (e.g. temperature, barometer, humidity, phase of moon, wind,etc) have been suspected as affecting the rate of emergence?

(d) At what temperature, on a falling scale, do larvae cease to feed? (Other atmospheric conditions also helpful).

(e) If any of the larvae survive, what becomes of them during the winter?

(f) What is the duration of larval life (from egg to pupa), and, once more, under what conditions?

Should any member have some small observation bearing on this subject, we hope that he will send it to us in an endevour to help forward the solution of the mysteries of our migrant lepidoptera. Perhaps members will take more detailed notes during the coming season.

No. 27. - From F.J.Clarke (No13) comes a query seeking advice as to the use of lepidoptera for garden decoration. By planting *Sedum spectabile* (Ice Plant), *Aster amellus* (Michaelmas Daisy), and *Buddleia variabilis* he has succeeded in attracting Peacocks, Red Admirals, Small Tortoiseshells, Commas, Brimstones, and the usal whites - also a small specimen of Orange Tip (wingspread just over one inch) and on one occasion a White Admiral. "But I was more ambitious and have attempted to rear *Papilio machaon* ([illegible] Swallowtail) and *Nymphalis antiopa* (Camberwell Beauty). These, however, all died without laying - in fact they declined to exist caged. The *P.machaon* larvae all escaped when full fed. I have a bed of fennel for feeding these but caging even a small bed is a job."

No. 28. - What is the nature and cause of set insects "going greasy", and how may this be prevented? I have noticed that when a specimen shows signs of grease, others in the same box or drawer speedily follow suit; whereas others of the same age, species and sex kept in different boxes remain free from grease, under similar conditions. In other words grease appears to be infectious and therefore might be caused by fungi or bacteria. Have any members examined greasy specimens microscopically to see whether there is any foundation for such a notion? Again, it has been suggested that specimens are more liable to grease in an atmosphere of camphor than in one of naphthalene or paradichlorbenzine. Once more, has this theory any supporters among us, and can they offer any possible explanation? A short article on the more successful methods of combating grease would be very greatly welcomed as one or two members have complained of trouble due to this cause.

B.A.C.

oOo

REPLIES TO QUERIES

No. 22: - The hibernation of *Eriogaster rubi* (Fox moth).

Practically all authors appear to have found difficulty with the rearing of this species. The general opinion appears to be that the most airy and natural conditions as are obtainable are the most successful, care being taken not to crowd too many caterpillars into a box.

It is very difficult, if not impossible to successfully hibernate the larvae indoors, but if in early winter they are exposed for a few nights to severe frost and then brought into a warm atmosphere many of them will spin up at once and pupate satisfactorily, the imagos emerging in the course of two or three weeks.

South (Moths 1, 1921 edn.P. 122-3) states that the late Mr Robson used to collect the caterpillars on fine days in early spring, put each caterpillar into a separate paper box about two inches square, and keep them on a shelf over the kitchen fire, where they would duly pupate.

B.A.C.

No. 16. - Journal No.9, Query No.16. - Breeding *Acherontia Atropos.*

The full-fed larva must be given plenty of depth of soil to go down in, so should be placed in a *large* flower-pot filled almost to the top with loose earth, 8 inches or more, when it will go right down to the bottom to form its pupal cell, which should not be disturbed on any account. Leave it out of doors, damping occasionally if necessary, until about January or February, when the pot containing the pupa may be brought indoors and exposed to a combination of warmth and damp, by standing the pot on a radiator or similar situation (insulated by a piece of board if *more* than about 100° F) and watering lightly at least once a day. The pot may be placed in a saucer containing a little moss to absorb excess moisture dripping through the pot. The moth should then imerge within 6 weeks . It must, of course, have room to expand it s wings. I usually place the pot, open at the top, inside an empty wooden packing-case laid on it s side and with it s lid replaced by a loose cloth. By this method I have reared perfect specimens without a failure so far. It is extraordinary how the moth can work it s way up through such a thickness of earth without disarranging a single scale. As A.atropos takes an out-size in setting-boards, see that you have a sufficiently large board ready before the moth merges.

T.Bainbrigge Fletcher.

oOo

WANTS AND EXCHANGES

Will those sending exchange notices in future please state for how long their notice is applicable. In the absence of such instruction their notice will be inserted once only. For addresses, refer to membership list (J.13 pages 9-10).

F.E.Briden (No.27) of 31, London Road, Stevenage, Herts, has a six-drawer birds'- egg cabinet (four drawers with double trays), solid mahogany throughout, with glass folding doors, together with a collection of birds' eggs that he would exchange for a butterfly cabinet of the same value. May be seen at the above address at any time.

H.Takenaka (No.51) will exchange butterflies and beetles from Japan with anyone in northern Europe for the following families of coleoptera,- Scarabaeidae, Lucanidae, Passalidae, Coccinellidae, Tritenotomidae, Cicindelidae, Carabidae, Cerambycidae, Brenthidae, Anthribidae, Curculionidae, Ipidae (Scolytidae) and Staphylinidae.

J.Walker (No.22) wants pupae of all hawk-moths, P.machaon (Swallowtail butterfly), S.Fagi (Lobster moth), and E.versicolor (Kentish Glory), in exchange for larvae of Callimorpha hera (Jersey Tiger moth) and imagos of many British species. He would also like to exchange many exotic butterflies, set or in papers, for others or foreign stamps.

G.B.Walsh (No.24) wants to obtain ova of L.hirtaria (Brindled Beauty), A.hispidaria (Small Brindled Beauty), and H.leucophaearia (Spring Usher). As duplicates he has numerous unusual coleoptera.

Urgently needed by A.F.O' Farrell (No.58) :- JAPANESE and other palaearctic species of the genus Monima (Taeniocampa). Living pupae preferred, but specimens, set or unset, accepted. Of British species only Scottish and northern forms wanted. Most of the commoner British lepidoptera, coleoptera and a few odonata (dragonflies) offered in exchange.

oCo

MEMBERSHIP CHANGES

NEW MEMBERS

No. 58; A.F.O'Farrell, 20, Crescent Road, London, S.W.20. (Odonata. Also lepidoptera, diptera)
No. 59; C.Down, Milton, 7, Mersham Drive, London, N.W.9. (Lepidoptera)

APOLOGY

We must apologise for the omission of No. 25 – A.Wise, 13, Third Avenue, Heworth , York. (Lepidoptera) from the membership list in Journal 13. (Eds)

REMOVED FROM MEMBERSHIP LIST

The following member has been removed from the membership list for non-payment of subscription :-
No. 8;- G.Newland, 20, Gledhow Gardens, London, S.W.5.

CHANGE OF ADDRESS.

No.20; - A.Kennedy, to:- 130 Vesper Road, Kirkstall, Leeds, 5, Yorks.

addressed to A.E.S. Box No. 6, 61, Okehampton Road, N.W.10.

PRESENT MEMBERSHIP - 55

oOo

CALENDAR

FEBRUARY AND EARLY MARCH

Lepidoptera;- It is still time for pupa-digging and egg-searching. For the former, oaks standing by themselves are especially profitable, while outskirts of woods, hedges, and fences are the next-best places to look. Replace the soil or sods after inspection in order not to spoil the chances for next year. Do not become despondent should you find nothing at all - one year's best spot may produce nothing the next and vice-versa. The thrill lies in the fact that you never know what may turn up just round the corner.

"Sallowing" may begin during February if the weather be mild. I actually saw some staminate flowers in Gloucestershire on January 6th when no doubt only hibernating species were about. In March the Quakers (Taeniocampa) begin to appear and visit these flowers (sometimes at sugar). I will describe sallowing in next month's Journal. The hibernating noctuidae will often put in an appearance at sugar on mild evenings.

Members should make a point of searching grassy and weedy hedgesides, meadows and heaths with the aid of a lamp after dark for larvae. Noctua xanthographa (Square spot rustic) will soon become a pest - but it is a useful species on which to practise preserving - at least when full grown in April.

Other species out now as imagines :-

Hybernia rupicapraria (Early) Search with lamp on hawthorn hedges.
H.leucophaearia (Spring Usher) and H.marginaria (Dotted Border).
Anisopteryx aescularia (March moth) and Phigalia pedaria (Pale Brindled Beauty)
Apocheima hispidaria (Small Brindled Beauty)
Pachys strataria (Oak Beauty) Males come to light, females of all except the last are wingless.
Pachycnemia hippocastanaria (Horse Chestnut). Heather, S.England.

B.A.C.

oOo

DEATH RAY TO KILL GRAIN PESTS

Startling headlines such as the above have recently appeared in numerous daily papers. The following is gleaned from the few fact which these paragraphs generally contain.

Dr.C.G.Lemon, who recently founded a Bacteriological and Pathological Section of the Radio Society of Great Britain has designed an apparatus to investigate the killing and curative powers of radio waves. It is claimed that all stages in the metamorphosis of weevils breeding in rice may be exterminated by this (apparently the same) apparatus.

The grain is passed down a chute on to a metal plate beneath a series of "gas-filled tubes" (presumably low-pressure discharge tubes, by reason of the mention of a "blue-light" and "crackling noises".) Radiations fatal to insect life are said to pass from the tubes to the surface of the plate, these being at three different wavelengths, the lowest in the region of 40 metres.

A machine costing £250 could treat ten tons of grain per hou consuming 1½ units of electricity in so doing, says Dr Lemon.

Should such an apparatus prove it's worth. it will no doubt be a great boon to cereal merchants, but at present the high primar outlay and slow action will no doubt prohibit its use as an economi instrument for destroying grain pests. B.A.C.

oOo

THE LAST ROSE OF SUMMER

On December 23rd 1936 B.A.Cooper took a perfect specimen of XANTHORHOE FLUCTUATA (Garden Carpet Moth) from a fence at Kensal Ris London, N.W.10.

oOo

EN

[illegible]

[illegible]

The Lin
a few [illegible]
[illegible]
[illegible]
Small [illegible]
[illegible]

[illegible]

THE
ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF
THE AMATEUR ENTOMOLOGISTS' SOCIETY

PRESENTED
BRITISH MUSEUM (NATURAL HISTORY) DEPARTMENT OF ENTOMOLOGY

VOL. 2 No. 15 PRICE SIXPENCE March 1937

CONTENTS

TITLE	AUTHOR	PAGE
General Remarks	Eds.	17
Calendar	B.A.C.	18
Working the nests of Formica rufa (Red Wood Ant) for beetles.	Geo.B.Walsh	18
Bee-keeping in Czechoslovakia	B.A.C.	19
Query No. 29	B.A.C.	20
No. 30	G.Burt	20
Replies to Queries: No. 26	Capt.T.Dannreuther	20
No. 20	C.W.Henderson	20
No. 18	J.Walker	20
No. 18	From J.W.Tutt	21
The Long-tailed Blue	T.B.Fletcher	24
A few Notes on Captures during 1936	J.Walker	24
Wants & Exchanges		24
Membership Changes		25
Small Pearl-bordered Fritillary	E.T.Daniels	25
Dragonflies	E.T.Daniels	25

Bulletin No. 16 will be published towards the beginning of April.

COMMITTEE

HON. SECRETARIES AND EDITORS:-

B. A. COOPER,
61 Okehampton Road,
London, N.W.10

A. N. BRANGHAM,
160 Haverstock Hill,
London, N.W.3.

Published by the Society in London.

THE ENTOMOLOGISTS BULLETIN

is published nine times per year by the

AMATEUR ENTOMOLOGISTS' SOCIETY

The annual subscription to the Society, which includes the year's Bulletins, is :-

Great Britain, Empire & U.S.A. ...	3/6 post free
Other Countries	5/- post free

This should be sent to the Hon. Treasurer, B.A.Cooper, at 61, Okehampton Road, London, N.W.10.

The subscription becomes due on January 1st, and members are requested to forward it as soon as possible to save trouble. The Amateur Entomologists' Society is at liberty to discontinue the sending of its publications to any defaulters after a period of grace of three months (i.e. after March 31st), so may we remind forgetful members to make a note of this in their diary lest they should find themselves accidentally cut off.

The Hon. Secretaries will be pleased to forward a free specimen copy of the Society's journal and a prospectus to any non-member likely to be interested, on receipt of name and address. They will also gladly send prospectuses to those members who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage.

The exchange column is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting many years are advised to confine themselves to the exchange of ideas, apparatus and live insects, leaving that of set, pinned and unpinned specimens till they have had more experience. It may be added that the Editors offer no guarantee for any articles offered herein, and they are in no way to be held responsible should the privilege allowed be abused. Unless we are informed otherwise, exchange notices will be inserted in the Bulletin once only. For addresses please refer to the annual membership list printed in the December number and subsequent supplements

Anyone at present not recording migrant lepidoptera who would care to note down and report anything anything connected with this subject that he might observe should write to B. A. Cooper for free literature and information.

If there are any members living abroad or in the provinces who are in the unfortunate position of not always being able to get the book they desire, we shall be glad to order it for them, postage being additional to the published price.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

welcomes anyone interested in any branch of entomology, and especially sets out to encourage the beginner.

THE
ENTOMOLOGISTS' BULLETIN

(FORMERLY THE JOURNAL OF THE ENTOMOLOGICAL EXCHANGE AND CORRESPONDENCE CLUB)

VOL. 11 No. 15 March 1937

HON. EDITORS:-
B. A. COOPER
A. N. BRANGHAM

Dear Fellow Members,

The subject of our Editorial Notes this month is the vital question, what is it that we find satisfying about Entomology which is lacking in other forms of hobby?

The answer, evidently, is manyfold. Few collectors, probably, would offer the same reasons for their attachment to the subject and yet all would agree to the presence of an undefinable urge. Who has not felt, especially in springtime, a burning desire to be off and away in the woods and fields, on the heaths and the downs and the moors? The lure of collecting does not enter into the matter; it is rarely until midsummer is near that collecting takes on such major importance for most of us. Yes, we may collect more avidly in spring than at any other time of the year, but it is not the thought of filling boxes and drawers, pages and catalogues that lures us on. It is the spellbound expectation of what we MAY catch or see that speeds us on. As the season advances and the deadening influence of autumn approaches, the joy of the hunt diminishes and we dwell more on the filling of our cabinet spaces. We begin to remember what we MIGHT have caught and next year seems far away. There is no doubt, however, that as one gets older, the enlargement of the collection becomes more and more the main object of our endeavours.

There are numerous other reasons for collecting which will be put forward as of primary importance. Some will collect for the beauty of their captures, possibly ornamenting their houses with paintings of gorgeous tropical butterflies or embroidering such designs on the furniture. Others, again, obtain greatest satisfaction in the rearing of species from the egg, or in trying to obtain hybrids and varieties by crossing and selection. More still find it as entertaining a form of outdoor recreation as they could obtain by any other means - the camera and notebook being additional weapons of attack in the field to these enthusiasts. A few will give their reason as being for the advancement of science. We are inclined to believe, however, that many of those who hold this view have yet to learn the real cause of their enjoyment from the hobby.

May we thank those of us who have done their best to help us on towards the conquering of new fields, and especially to our typists, Messrs. A. Glanfield and E. T. Daniels, who have so adequately produced our stencils. Our thanks also to Mr. Glanfield for offering to act as auditor to the accounts, and to those donors who have already paid for the additional cost of a front cover.

Wishing you all a prosperous and successful season,

Yours sincerely,

B. A. COOPER
A. N. BRANGHAM

Hon. Secretaries & Editors.

oOo oOo oOo oOo

CALENDAR
March and Early April

Lepidoptera - Most hibernating larvae will have reawakened before March is out. Therefore may this serve as a reminder to those among us who have left theirs untouched through the winter months to make sure that they have sufficient fresh food during the coming weeks. Most species may now be safely brought into the warm if they are to be successfully induced to feed and spin up early. If the weather, however, is very cold it would be as well, before doing so, to wait until the temperature outside has itself risen.

Many of the hibernating noctuids put in frequent appearances at sugar, but, strangely enough, very few of the spring-emerging species have a great partiality for this form of bait. The blossoms of several sallows (*Salix* sp.)however, are found to be exceedingly attractive even to geometers and micros.

Briefly, the method of working these is as follows:- The best positions as a rule are those where several bushes occur together, but if very many are present the moths will be found to be so distributed through them that they are few and far between. The bushes are examined by day and as much of the undergrowth as possible is removed from beneath to avoid one's getting tangled up in the dark. Shortly after dusk the moths will be found feeding on both male and female flowers, completely intoxicated in most cases, although a few such as the Early Grey (*Xylocampa areola*) and the lighter bodied insects will always remain active and may require skilful netting. An open inverted umbrella or beating tray is then held beneath and the branches tapped with a stick or shaken by hand or foot. Alternatively, a sheet may be laid on the ground under the bush to be disturbed. On cold or moonlit nights little may appear, but on others, especially when wet and warm, the various quakers will abound on the sallows, tumbling into the sheet in hundreds, their eyes gleaming in the dim torch light. Such evenings are enough to make the beginner's heart leap within him, while even the most hardened rarity-hunter will smile at the sight of so many caught at one fell blow. But there is scarcely time for choice; they must speedily be boxed ere they have recovered and are once more whirring round one's ears and lights often and anon tumbling into the same sheet during the course of one evening. Hibernated species may well be kept for eggs which they often furnish freely, while even the catkins which fall off may profitably be collected in order to breed certain larvae. During April when the sallows are over plum, apple, sloe, and bullace blossom may be dealt with similarly and often with as good results.

Light is worth while at this season, while larva searching must not be neglected in favour of the more exciting prey. The season has begun now and we must not lose our opportunities.

B. A. C.

oOo oOo oOo oOo

Working the nests of *Formica rufa* (Red Wood Ant) for beetles

The nests of ants contain many species of interesting beetles which are only rarely or casually found in other habitats. March is a very convenient time for searching for these myrmecophiles because the beetles are mostly in the imaginal state and the ants are starting their summer's work, but are not yet so active as to be very inconvenient to the collector.

The best plan is to sieve roughly the material in the field and then to examine it more carefully at home.

In field work I use a cylindrical coarse calico bag, 2 feet long and 1 foot in diameter. At the bottom is a sheet of perforated zinc with holes of $\frac{3}{8}$ inch diameter. (This is useful for other methods of collecting beetles). Attention should not be restricted to the large nests for quite small nests have often a large beetle population. The sleeves are rolled back, and the trousers fastened securely round the ankles either with string or with cycle ring-clips; even with these precautions the collector will probably find that stray ants will penetrate his defences and may even cause him to seek seclusion where he can remove part of his clothing to round up rovers on a border foray. The sieve is now placed with the open mouth on a rubber sheet or piece of brown paper, and two or three double handfuls of material are grabbed from the middle of the nest and dropped into it; every scratch and cut on hands and face will reveal itself as a more or less severe smart, which, however, soon passes off. With rapid shaking all the finer material passes through the perforations; a little time is given for the ants to work to the edges of the sheet, and the material is again passed through a finer garden sieve, and the material that passes through this is put into a small linen bag and brought home. Examination in the field will give some idea as to whether living beetles are being successfully collected. The coarser material should all be put back in the nest, and in no case should a nest be so badly disturbed as to cause its destruction.

At home, the material should be examined in small quantities at a time which are passed through the fine sieve and spread in a scattered way over a large meat-dish. Some beetles like Monotoma spp. are very sluggish, and take some little time to stir, and very minute ones like Ptilium myrmecophilum are so very small that they readily hide among the little particles of rubbish, so that the work takes time.

The laurel tube can be used for killing the larger species; Myrmetes and Dendrophilus need to be kept in this a rather long time to relax. The very small Trichopterygidae are best collected in a separate little dry tube and then put into an egg-cup; when they are running about, a little boiling water is poured over them, so that they die with their legs and antennae spread out; they can be picked up on a fine camel-hair brush, dried on blotting paper, and set in the minimum quantity of gum. The small Staphylinidae should also be collected in a separate dry tube. When the requisite number has been obtained, the closed end of the tube is lowered into boiling water for about five seconds. In this way the beetles are killed without being wetted. They are then loosely wrapped in a wad of tissue paper, which is put into a laurel bottle for two or three days to relax. They can then be set to form good cabinet specimens.

The naming of the captures is usually not very difficult. Fowler's "British Coleoptera Vol. VI" and Donisthorpe's "Guests of British Ants" give a list of the species to be found with Formica rufa, and the names can be found by a process of elimination, with a check by the use of the detailed descriptions.

Geo. P. Walsh.

oOo oOo oOo oOo

BEE-KEEPING IN CZECHOSLOVAKIA.

Drastic steps are now being taken by the authorities in Czechoslovakia to deal with that curse of hive-keepers known as Acarine disease. A new law enforces the treatment of all colonies within ten kilometres of an infested hive by the recognised British or Frow remedy. Stocks found to be weak in mid-August are to be compulsorily destroyed, while those discovered to be infested after overwintering are to be treated during the spring till honeyflow with methyl salicylate. It is expected that these precautions will cause a steady reduction in the prevalence of the disease.

B. A. C.

QUERIES

No. 29. We should very much like to hear the observations of members who have made use of light and collecting lamps, and the kind of light used. If able to give further particulars such as approximate candle power, colour of light, weather conditions, and so on, so much the better. The notes of any who have used more than one source of illumination will be exceptionally valuable We may then be able to recommend, possibly, certain types of lamp for general use as against certain others which might be just as brilliant but possibly less attractive. Notes of any who have made use of light traps, recently or otherwise, would also be very helpful.

B. A. C.

No. 30. G. Burt records that last year larvae of _Thecla quercus_ (Purple Hairstreak) taken at Broadmayne, near Dorchester, on oak (_Quercus robur_) were bred on blackthorn and on two other species of oak cultivated in England, viz. (_Q. ilex_) (Holm oak) and _Q. cerris_ (Turkey Oak). South gives this species as feeding on okak, sallow and Spanish chestnut (_Castanea sativa_). This brings up the question of the utility of the latter two species of oak for the breeding of _robur_-feeding species. Comments invited from members who have made use of these latter or who know anything of their possibilities. The Turkey oak, for example is a much faster growing plant than our English species, and is often planted in parks and large gardens for its fine appearance.

B. A. C.

oOo oOo oOo oOo

REPLIES TO QUERIES

No. 26. Capt. T. Dannreuther sends us the following:- Guy T. Adkin took fresh specimens of _P. gamma_ (Silver Y) on Jan. 18th and 29th 1937 in his light trap at Bayonne, Basses Pyrenées, during an exceptionally warm spell (the January isotherm is 48° F). This may show the northern limit this year at which _P. gamma_ is continuous brooded. There have been no winter records in the British Isles for some years. Were these early captures themselves migrants, or were they late (or early) emergences, and would they have produced offspring capable of reaching maturity in that district? No further notes have been received up to the time of typing this page.

No. 20 C. W. Henderson has found the same difficulties as A. N. Brangham in mating of coleoptera and also in the rearing of the exposed phytophagous (plant-feeding) larvae. He writes as follows:- "What I have done has been confined to the wood feeders. The larvae, having been taken "in the field", have been placed on arrival home in biscuit tins and finally bred through to the perfect insect. It has often surprised me that after some months, and, in the case of _Rhagium_, I think I can say after eight or nine months, that the beetles are still hale and hearty. In these biscuit tins I have reared, among others, species of the genera _Dorcus_, _Sinodendron_, _Tetropium_, _Aromia_, _Clytus_, _Leptura_, and _Trachodes_, but I have never succeeded in pairing the sexes. It is my opinion that some of the mycetophag (fungus-feeding) species might offer the best likelihood of success in this direction".

No. 18. (See also J. 13, p.5; J. 9 pp.3,4; J.7 p.4; J.2 p.2) An interesting enquiry is made in our December Journal as to whether any members of the Sphingidae are attracted to light. My answer is yes - but only to certain qualities of light. The height of the light above the ground has not such a marked effect as the kind of light used in the attraction of insects.

In my experience of light, extending over many years, I have found that the modern methods of illumination are not so beloved of insects as were the earlier forms - many small moths will, for instance, come to the light of an old fashioned tallow candle.

Again, when the street gas lamps used the old fish-tail burners consuming the gas direct, many more insects were attracted to them than today; now, with a much more powerful light from the self same lamp-posts, very small numbers are to be seen flying around, even on "good" nights. The same applies to electricity. When first the streets were illuminated with electricity, carbon arc lamps were used and the insects in this locality (Torquay, Devon) were attracted to them in swarms. Nowadays, with the filament bulb on the same holders one seldom sees many that have succumbed to the lures of brilliance. I have seen around the old carbon lamps in the evening dozens of insects flying round and round. They would circle until exhausted when they would fall to the ground with a thud so that one could easily pick up the specimens one wanted. It was surprising what numbers and varieties could be taken, including species one never sees nowadays except in the larval stage.

Of the hawk-moths, from May onwards I used to pick up under the lamps or net while flying around, the Lime (*D. tiliae*) Poplar (*A. populi*), Eyed (*S. ocellatus*), Privet (*S. ligustri*) - this latter being very common with five or six captures during an evening - Large (*C. elpenor*) and Small Elephant (*M. porcellus*) and Convolvulus (*H. convolvuli*); in the year 1910 Convolvulus hawks were as common as Privet hawks. I have been lucky enough to get two Deaths-head hawk moths at light; one I netted myself and the other was given to me by the man who used to clean out the globes of the lamps. This personage used to save me many moths, but usually they had their wings badly crumpled up by the heat of the carbons. I have never seen any of the day-flying hawk moths such as the two bee-hawks (*H. fcuiformis* and *tityus*) or the Humming-bird hawk moth at light.

I have used a 200-candle-power petrol lamp and a large white cloth spread out on the ground for attracting moths, placing the lamp in the centre of it. This kind of light is more attractive when on the cloth than when it is just placed on the ground or hung from the branch of a tree. The only hawk moth I have taken with a petrol lamp is the Privet hawk.

The lights of motor cars are some of them very powerful, but, stopping by the roadside in country lanes, commons, or near woods where one would think light would attract moths, the results are not quite as expected. Large moths do not come freely up to the headlights, although they can be seen flying through the beams; Geometers that are not far away, however, will always approach. Car lights will also startle many kinds up from the hedges or herbage, but they quickly disappear into the darkness.

This, I think, is proof that it is not the intensity or candle-power, but the quality, of light, which causes the attraction. It looks as if the more primitive forms of lighting, being more irresistible to insects, possess some ray or rays vital to the entomolcgist which are lacking from the more modern systems of illumination.

J. Walker

No. 18. Attraction of Sphingidae to light. J.W.Tutt in British Lepidoptera, Vols. 111 and 1V, gives the following notes:- *Mimas tiliae* (Lime Hawk): "The imagines are occasionally attracted to light. We have captured it clinging to lamps at Strood and Peckham; captured at light at Wickham Fen (Studd); very common at electric light at Berne, May 2nd-10th, 1893 (Knecht); frequently at light at Worcester (Rea); at light at Cheltenham (Winterbotham); at Aigle, 7 examples, from 9.15 p.m. - 10.20 p.m., on July 3rd and 4th 1898 (Lowe); at the electric light at Chester (Arkle)" (111, p.417)

Smerinthus ocellatus (Eyed Hawk): "The imagines are frequently taken at light at Lincoln (Musham), and at Ahascragh, commonly (Dillon), at the electric lights at High Wycombe (Peachell), and at Chester (Arkle); they occur at electric light at Berne (Hiltbold), and three examples were taken at electric light at Borshom by H.R.H. Prince Nicolas Romanoff" (111 p.442)

Amorpha populi (Poplar Hawk): "The males are also attracted freely to light - commonly at Worcester (Rea), males at Weymouth (Peachell) at West Dulwich (Fletcher), at Lincoln (Musham), in the Wye Valley (Vaughan), commonly in the light traps at Oxton (Studd), at the electric lamps at Hampstead (Hopson), and Chester (Arkle), especially abundant on the street lamps at Gosport, often as many as 3 on a lamp (Pearce). Prideaux also notes a female on a gas lamp which had laid an egg on one of the glass panes". (111 p.488)

Hemaris fuciformis (Broad-Bordered Bee Hawk) No record

Hemaris titvus (Narrow-Bordered Bee Hawk) No record

Macroglossa stellatarum (Humming-bird Hawk): "There are two records of its having appeared at light, Studd, on one occasion took it in his light-trap at Oxton, and Blakeborough records one at light at 10.30 p.m. on Aug. 2nd 1900, at Brighouse". (1V p.25)

Chaerocampa elpenor (Elephant Hawk): "The imagines are also attracted to light - at the electric lights at Berne (Hiltbold), at Pörtschach (Wagner), most abundant on July 3rd-4th 1898, from 9.15 p.m. to 10.20 p.m., at Aigle, at the electric lights (Lowe), also at electric light at Eastbourne (Dewey), at Ipswich (Morley), at Chester (Dobie), at light at Taunton (Farrant), at Paul (Daws), at Erith (Fenn), at Winchester (Shepheard-Walwyn), etc." (1V p.83)

Metopsilus porcellus (Small Elephant Hawk): "They rarely come to light in Britain, but there are some records - at Taunton in 1866 (Farrant), in August at Wallasey (Powley), at Winchester (Shepheard-Walwyn), at Appledore (Hartland), on lamps at Worcester (Rea); on the continent it is often recorded at light, e.g. at Namur the imagines often come to light (Tambillion), common at electric light at Berne from April 12th-Aug.15th 1893 (Hiltbold), at electric light at Aigle on July 3rd-4th 1898 (Lowe), common at electric light at Zurich in May and June 1893-5 (Nageli), abundant at electric light July and August 1896 at Aix-les-Bains (Aggassiz) (1V, p.107)

Hippotion celerio (Silver-striped Hawk): "Newnham observes that he has seen the imagines flying at dusk literally in hundreds over the flowers of jessamine in Western India; they only appear to come for about half an hour each evening, and occur about mid-June and again in September, possibly also in April, as most of the Sphingid are treble-brooded in India, and, contrary to what most books state, he has never captured this species at light, even when Manduca atropos and other species were coming in numbers to the argand lamps" (1V, p.128). "In spite of Newnham's experience in India the species has often been noted at light - at Beccles, and at Brighton, at 2 a.m. (Winter), at South Foreland lighthouse (Fremlin), at Chichester (Anderson), at Ashford (Viggers), at Ryde (Ingram), at Nottingham (E.W.Int., 1X, p.3), at Cromer (Barclay), at Taunton (Bidgood), at Sandown (Frost), at Birmingham (Enock), at Plymouth (Cregoe), at Southborough (Shepheard-Walwyn), at Tan-y-Bwlch (Kerr), at Southover, near Lewes (Baker), in Paris (Haslen), etc., and Meade-Waldo obtained imagines on August 14th and 26th, 1901, at Tangier, that had blown into the hall to light at about 6.30 p.m. (1V, p.129)

Phryxus livornica (Striped Hawk): "Few examples have been taken at light - Oberthur states that a specimen was captured at the electri lamp on the Riffel Alp at the end of July 1902; Fletcher notes this species at light on July 20th 1898 on board ship at Wei-Hai-Wei; Frohawk records an example at the lighthouse lantern at St. Agnes, Scilly, just before sunrise, also one on an electric lamp at Carrow, near Norwich (Laddiman), on a gas lamp at Dover [illegible], at light at Limpsfield (Patterson), flew into a room to light at Hunton, near Maidstone (Greville), three round a lamp at Worcester

(Edmunds), flew into a room at Coles Cross (Helps), at light at Ventnor (Keet), at Wolverhampton (Morris), at Merthyr Mawr (Hampson), flew into a room at Mullaghmore (Greene)" (lV,p.160)

Deilephila galii (Bedstraw Hawk): "This species is not very frequently recorded at light. Tetley, however, notes that imagines occurred at Taunton in 1888 in some numbers at electric light, nearly all being much damaged, as they had got inside the large globes of the lamps; Farrant captured four thus (Ent.XXlll, p.100). Bloomfield heard of one taken at electric light at Hastings in 1892; Burrows took one on a lamp at Snaresbrook Station; Sheldon had one fly into his room at Kingsdown in 1888, as did Stainton at Lewisham, whilst Murray records one as flying into a forge at Lancaster" (lV,p.191)

Deilephila euphorbiae (Spurge Hawk) "Mathew statees ....that they were seen flying around the ship off Cyprus, Corfu and Crete in June 1898 whenever the lights were burning. He states that the imagines are evidently on the move for a considerable time during the night for he has seen them flying to the electric light from soon after sunset until past midnight...; very abundant at light at Aix-les-Bains, in July 1896 (Agassiz); common at electric light at Davos-Platz etc. (Sellon); at electric light at Berne, June 21st 1893 (Hiltbold); also in August from 1893-1895 at Zurich (Nageli), at electric light, July 3rd-4th, 1898, at Aigle, from 9.15 p.m.-10.20 p.m.,...also at Zermatt from August 15th-19th, 1898 (Jones)" (lV, p.238)

Daphnis nerii (Oleander Hawk): "Flying into an open window to light at Brighton (Thorncroft and Tidy), also into a room at Glasgow (Wilson), a female flew into a window at about 6.30 p.m. to light at Yelding (Reid), and at one of the electric lights at Eastbourne (Alford)" (lV, p.260).

Hyloicus pinastri (Pine Hawk): "It comes occasionally to light, e.g. not common in June 1892, but somewhat abundant from May 3rd, 1893, at electric light at Berne (Hiltbolt), also at Aigle, at electric light, July 3rd-4th 1898 from 9.15-10.20 p.m. (Lowe), very abundant at electric light in July, 1896, at Aix-les-Bains (Agassiz)" (lV, p.291)

Sphinx ligustri (Privet Hawk): "It is often attracted to light and has been recorded thus - from Chester (Arkle), Winchester (Shepheard-Walwyn), Emsworth (Christy), Horrabridge (Still), Wicken (James), as well as at Bristol (Bartlett), at Oxton (Studd), at Boscombe (Robertson), and at electric light at Kingston-on-Thames (Cooper) at Taunton (Farrant), at Eastbourne (Dewey), at Ipswich (Morley), at High Wycombe (Peachell), at Berne (Bexteli), at Zurich (Nageli), at Aix-les-Bains (Agassiz), etc". (lV, p.323).

Herse convolvuli (Convolvulus Hawk): "The insect is sometimes attracted in large numbers to light; in mid-August 1901, the imagines were to be seen every morning in large numbers lying dead beneath the electric lamps in the street of Turin; in the middle of August 1897, several flew into the lighted rooms of the hotel at Susa, and at the end of July 1900, a fine specimen flew into a lighted room at Larche, where we were staying. It is also recorded at electric light at Portschach (Wagner), at Berne (Benteli), at Zurich (Nageli), at Aix-les-Bains (Aggassiz), at Davos-Platz (Sellon), and in Britain, at Taunton (Farrant), near Cheltenham (Frye), at Hammersmith (Bird), at Farnham (Tewcock), at Norwich (Tillyard), at Maldon (Bentall), at Stratford and Ilford (Murray), at Paul (Daws), at Brentwood (Raynor), at Burgess Hill (Dollman), at Eastbourne (Adkin), at Forest Gate (Harrison), at Gravesend (Jennings), at Brighton (Meaden) and at Norwich (Thouless)". (lV, p.374).

Acherontia atropos (Death's Head Hawk): "Reaumur notices (Memoires, ll, p.296) that, in France, the moths fly into rooms to light with great bustle and noise, and Caradja (Iris, Vlll, p.62) makes a similar observation for Roumania, whilst they have been frequently noted as flying into rooms, etc. by other observers. Hiltbold has taken it at electric light at Berne, Agassiz at Aix-les-Bains, whilst Bartel also records the moths as being attracted to light. Kerry captured one at electric light at Parkeston, near Harwich, on September 26th, 1883 (Young Nat, V, p.48); Baxter records (Ent. Rec., 11, p.253) one attracted to the light of a signal box, October 8th, 1891, at St. Annes-on-Sea; Doncaster (Ent. XXX111, p.304) on a street lamp in the Strand, October 3rd, 1900; Chope (Ent. XXV111, p.309) at Colyford, about 8.30 p.m., during rain; Wollstein (loc. cit., p.310) at electric light at Kingston-on-Thames; at electric light at York, October 22nd, 1901 (Hawkins); recorded as being taken at light, at Reigate, September 6th, 1868, by Blackburn (Ent. Mo. Mag., 1, p.130); on a lamp at Bradford, September 17th, 1896 (Carter); at Hackney (Hall); at Mansfield (Daws); at Taunton (Farrant); at Ayton (Whitaker); at Ryde (Moon); at Edinburgh (Burn), whilst one was captured at the entrance gate leading to St. Agnes' lighthouse, Scilly, September 14th, 1895, evidently attracted by the light (Frohawk)". (1V, p.438).

from J.W.Tutt.

THE LONG-TAILED BLUE.

(See Journal No. 12, p.8)

In India, *Lycaena boetica* (Long-tailed Blue) is a minor pest of Garden Peas and of Red Gram (*Cajarus Indicus*) and is also a pest of the latter in Java. I do not know that Red Gram is ever grown in England, but it would probably grow in the south. Whether it would attract any Blue Butterflies there is another question.

T. Bainbrigge Fletcher

A FEW NOTES ON CAPTURES DURING 1936

A friend and I had the pleasure of taking *Lycaena arion* - the Large Blue butterfly - in July last, on Dartmoor.

On September 21st and 22nd two imago *Colias hyale* (Pale Clouded Yellow) were seen, one by Mr. Down in a quarry and the other by myself on a Valerian plant. *Colias croceus* (*edusa*) (Clouded Yellow) was fairly common on the cliffs around Torbay from the second week in August to the end of September. I also saw two males of the latter species on Bream Head, near Burnham-on-Sea, on October 4th.

The *Vanessas*, except for *urticae* (Small Tortoiseshell) which was extremely abundant, were scarce throughout the season; I saw very few *io* (Peacock) or *atalanta* (Red Admiral), while *cardui* (Painted Lady) were likewise scarce - in fact I saw more in May and early June than in August or September. *Polygonia c-album* (The Comma) is still holding on in this district (Torquay, Devon) but is local, apparently being confined to certain districts.

Moths were scarce, sugaring not producing very much, but ivy blossom was fairly good. The weather for the year was poor from an entomological point of view.

J. Walker.

WANTS AND EXCHANGES

Exchange notices are inserted once only unless the auth informs us otherwise. For the addresses of members, refer to th membership list (J.13, pp. 9-10, and supplement in each later iss

G. D. S. Greig (No.10) has for exchange young larvae of *Lasiocampa trifolii* (Grass Eggar). He requires only pupae of Sphingidae.

B. A. Cooper (No.19) would like to hear from any member who makes lantern slides of entomological subjects, or who could lend him negatives for this purpose.

G. Burt (No.48) has for exchange a small number of lar of *Lasiocampa quercus* (Oak Eggar) and *Arctia villica* (Cream-spot Tiger)

Fumikiko Yano (No.38) requires cockchafers, dung-beetl and golden beetles (Chrysochroa elegans). He will send in excha butterflies, beetles, or anything else wanted from the East. H would also like to exchange entomological and illustrated magazines.

Will all members who are interested in the collection or recording of British Ants please communicate with A. N. Brangham, as he wishes to collect all possible data regarding these insects. He is anxious to receive living colonies of British and Foreign species. This invitation is extended to members living overseas. Any members who feel that they would like to take up this interesting side of entomology should write to A. N. Brangham, who will be pleased to give all the help he can.

oOo oOo oOo oOo

MEMBERSHIP CHANGES

NEW MEMBERS

No. 60: Captain T. Dannreuther, Windycroft, Hastings.
No. 61: L. H. Ennis, 16, Ernle Road, London, S.W.20 (Lepidoptera, Coleoptera).

RESIGNED

No. 28: N. C. Tilleau, Lausanne, King's Road, Horsham, Sussex.

PRESENT MEMBERSHIP: 56

oOo oOo oOo oOo

Small Pearl-bordered Fritillary (*Argynnis selene*)

The coastal marshes on the extreme east of Norfolk are protected from the inroads of the sea by a long range of sandhills. On the landward side of these the Dog Violet (*Viola canina*) flourishes, and so, too, do the Dark Green and Small Pearl-bordered Fritillaries. The occurrence of the latter is curious, as it is a species which one usually associates with woodland glades, and there is none of these within miles. The butterfly, of course, normally flies in July and August, but in 1936 a faded specimen was noted on Ragwort as late as September 6th, while on August 22nd the species was abundant in this locality. These facts seem to indicate that a second brood was produced during August, and although this is known to happen "in fine warm summers" one would hardly place our past summer in this category so far as June and July were concerned!

Dragonflies.

On the same coastal marshes on September 6th 1936 I was lucky enough to capture a male *Sympetrum sanguineum*. This species is much rarer than the universally-distributed *Sympetrum striolatum* - the brownish, medium-sized, swift-flying dragonfly - whose males sometimes have crimson abdomens. The colour of *S. sanguineum* is richer in tone, and it is noticeably smaller and weaker on the wing. Exactly a week later, in the heath country in thw west of the county, I came across a party of large dragonflies of the genus *Aeschna* hawking over one corner of a field. There were about a dozen all told, and at least half of them were of the migratory species, *A. mixta*, which is the smallest of the genus and may be told in flight by this feature alone. Both sexes were represented, the males appearing a lovely blue, whilst the females were duller and greener. On September 20th I found another *A. mixta* (a female) with a crumpled hind-wing, resting on a furze bush.

E. T. Daniels.

oOo oOo oOo oOo

PRICE LIST OF:-

OVA-LARVAE-and-PUPAE for SPRING.
-1937-

Terms: CASH WITH ORDER.

From:-

DENNIS E. BALLINGER.,
Entomologist, Naturalist,Etc.
"THE COTTAGE",Canham Road,Acton.
WEST -3-

POSTAGE. Extra in all cases(Except where stated) On OVA 2d. On LARVAE and PUPAE,SET INSECTS Etc. 4d, On Apparatus please add 9d. Any over will be returned with goods. -Please send P.O. for goods over 2/- in value. STAMPS ACCEPTED UP TO THIS AMOUNT.(ie."2/-")Next List May.193

The following are expected to be in stock during MARCH. ARRIL and MAY. PUPAE READY NOW. PLEASE ORDER WITHOUT DELAY. Not less than ONE DOZEN OVA or ½ DOZEN LARVAE OF A SPECIES CAN BE SUPPLIED.

-OVA-

Species.	Price per doz.	Species.	Price per do
Adippe,High Brown Frit.	9d.	Lineola,Essex Skipper.	8d.
P.Napi, Green Vein White.	6d.	P.Rapae,Small White.	6d.
Antiqua,Vapourer.	6d.	VERSICOLOR,Kentish Glory.	6d.
VERSICOLOR,AVIEMORE form.	2/-.	Carpina, Emperor.	9d.
P.Populi,December Moth.	9d.	Neustria,Lackey.	6d.
Neustria, LARGE RING OF EGGS.	1/6.	Flavicornis,Yellow Horned.	6d.
Nupta,Red Underwing.	9d.	Illunaria,Early Thorn.	6d.
Instabilis, Clouded Drab.	3d.	Aurago,Barred Sallow.	1/-.

-LARVAE-

Species.	Price per doz.	Species.	Price per do
Artemis,Greasy Frit.	2/-.	Athalia,Heath Frit.	3/6.
Cinxia,Glanville Frit.	2/6.	Paphia,Silver Washed Frit.	3/6.
Dominula,Scarlet Tiger.	1/6.	Caja,Garden Tiger.	1/-.
Hera,Jersey Tiger.	5/-.	B.Quercus,Oak Eggar.	3/-.
Quercifolia,Lappet.	4/-.	Grossulariata,Magpie.	6d.
Smaragdaria,Essex Emerald.	8/-	" From VARLEYATA.	30/

-PUPAE-

Species.	Price each.	Species.	Price each.
P.Brassicae,Large White.	1d.	NAPI.GREEN VEINED WHITE.	2d.
Machaon,Swallowtail.	1/-.	Tiliae,Lime Hawk.	4d.
" EXTRA LARGE	1/6.	" EXTRA LARGE	6d.
Jacobaeae,Cinnabar.	2d.	" ONE SPOT.	1/-.
Versicolor Kentish Glory.MALES	6d.	Bucephala, Buff Tip.	1d.
" " FEMALES.	9d.	Flavicornis,Yellow Horned.	2d.
POPULI,Poplar Hawk.(Few only)	4d.	Lychnitis, Lychnis Shark.	8d.
" PINK VAR.(FEW ONLY)	1/-.	PINASTRI,PINE HAWK(FEW ONLY)	5/
ELPENOR,Elphnt.Hk. (FEW ONLY)	6d.	" SELECTED FEMALES	8/-.
LIGUSTRI,Privet Hk. (Few Only)	1/-.	Certata,Scarce Tissue.	3d.

THE AMATEUR ENTOMOLOGISTS SOCIETY. Founded to serve the needs of amateurs and beginners. It publishes 9 Bulletins per year, these bein kept as non-technical as possible. Inclusive subscription 3/6 per yea

For specimen Bulletin and full particulars send 3d.in stamps(as par cost) to Hon Sec. B.A.COOPER, 61,Okehampton Road,London.N.W.10.

SETTING BOARDS. I have still a few RECONDITIONED Second Hand Board in stock. Assorted sizes,flat and Oval. 7/-. per doz Post free. 14 ins long. A few 12" long at 6/- doz. Post Free. First letters opened receive.

NETS...STORE BOXES...SETTING BOARDS...BREEDING CAGES...Large stock ready. Prices and details on receipt of stamp.

BREEDING CAGES.Wood with large glass front. 2/6 POST FREE.
COLLAPSIBLE BREEDING CAGES. IMPROVED PATTERN. 4/- Post Free.

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

VOL. 2 NO. 16 PRICE SIXPENCE April 1937

PRESENTED

BRITISH MUSEUM (NAT. HIST.)

CONTENTS

TITLE	AUTHOR	PAGE
Editorial	Eds	28
A South African Migrant	H. M. Millar	29
Calendar	B. A. C.	29
Wasps in November	T. B. Fletcher	30
Migration Notes	Eds	30
Phenological Recording	B. A. C.	31
Water-beetles in April	Geo. B. Walsh	31
Query No. 31	A. F. Chipperfield and G. V. Day	32
No. 32	E. U. Fox	32
No. 33	T. D. Fearnehough	33
Replies to Queries: No. 27	T. Dannreuther	33
Wants & Exchanges		33
Membership Changes		34
Collecting Lepidopterous Larvae among Heather	B. A. C.	34

Bulletin No.17 will be published towards the beginning of May.

COMMITTEE

HON. SECRETARY & EDITOR:-

B. A. COOPER,
61, Okehampton Road,
London, N.W.10

To whom all matter for the Bulletin should be sent.

HON. ASSISTANT SECRETARY
C. H. VIALE,
8, Hurst Road,
Bexley, Kent.

HON. EDITOR
A. N. BRANGHAM,
160, Haverstock Hill,
London, N.W.3.

Published by the Society in London.

PHENOLOGICAL OBSERVATIONS

Date of appearance of the following lepidoptera, Average, Hastings 1936 records, and column for members' records.

SPECIES	AVGE	(H.G. McLeod) HASTINGS 36	MEMBER'S OBS. & NOTES
H. marginaria(Dotted Border)	17/2	29/2	
T. stabilis(Common Quaker)	10/3	10/3	
L. multistrigaria(Mottled Grey)	21/3		
X. areola(Early Grey)	23/3	4/4	
A. badiata(Shoulder Stripe)	29/3		
P. rapae(Small White)	4/4;20/7	21/7	
S. bilunaria(Early Thorn)	4/4;24/7	29/4;30/7	
P. gamma(Silver Y)	6/5	7/5	
T. punctularia(Grey Birch)	30/4		
X. fluctuata(Garden Carpet)	30/4;21/7	6/5;30/7	
L. argiolus(Holly Blue)	30/4;26/7	3/5; 3/8	
C. ferrugata(Red Twin-Spot Carpet)	13/5;27/7		
C. luteolata(Brimstone Moth)	13/5;10/8	8/5;12/8	
C. pamphilus(Small Heath B.)	19/5	16/5	
S. menthastri(White Ermine)	20/5	28/5	
A. plagiata(Treble Bar)	22/5;15/8		
X. montanata(Silver-Ground Carpet)	22/5	27/5	
H. lupulinus(Common Swift)	23/5	23/5	
T. jacobaeae(Cinnabar)	23/5	23/5	
P. icarus(Common Blue)	23/5;30/7	16/.(Wannock);25/8	
M. dentina(Shears)	1/6	10/6	
S. lubricipeda(Buff Ermine)	2/6	24/5	
M. trigrammica(Treble Lines)	5/6	28/5	
C. [illegible]	8/6	3/6	
C. bilineata(Yellow Shell)	[illegible]	7/6(F.D.)	
M. strigilis(Marbled Minor)	12/6	27/5	
M. [illegible]	15/6	14/6	
Z. filipendulae(Six-Spot Burnet)	18/6	27/6	
T. pronuba(Large Yellow Underwing)	20/6	17/6	
X. monoglypha(Dark Arches)	22/6	7/6	
P. chrysitis(Burnished Brass)	22/6	20/6	
M. persicariae(Dot)	2/7	11/7	
A. grossulariata(Magpie)	[illegible]/7	28/6	
B. gemmaria(Willow Beauty)	[illegible]/7	20/6	
L. lithargyria(Clay)	6/7	24/6	
O. sambucaria(Swallowtailed)	8/7	5/7	
L. conigera(Brown-Line Bright-Eye)	9/7	12/7	
B. perla(Marbled Beauty)	9/7	24/6	
P. similis(Yellow Tail)	10/7	11/7	
A. urticae(Small Tortoiseshell)	12/7	20/6	
C. trapezina(Dun Bar)	16/7	30/7	
C. limitata(Shaded Broad Bar)	21/7		
N. io(Peacock B.)	6/8	8/8	
O. antiqua(Vapourer)	10/8	7/8	
N. xanthog(Square Spot Rustic)	12/8	31/7	
T. popularis(Feathered Gothic)	28/8		
A. circellaris(Brick)	20/9		
A. lychnidis(Beaded Chestnut)	24/9		
O. vaccinii(Chestnut)	28/9		
M. oxycanthae (Green Brindled Crescent)	3/10		
O. dilutata(November)	14/10		

NAME:......................

ADDRESS:...................

LOCALITY OF OBSERVATION:............

RARE SPECIES SEEN 1936, HASTINGS:- D. chaonia, N. ziczac, L. camelina, H. derasa, P. flavicornis, D. pudibunda, S. pavonia, D. falcataria, C. glaucata, H. prasinana, P. fuliginosa, O. quadra, D. coryli.

The table completed as far as possible, should be returned to Major H.C. Gunton, c/o Royal Entomological Society, 41, Queen's Gate, London, S.W.7., by November 1st.

(A. E. S. sup. No. 16B)

DAY	APRIL		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV		DEC	
	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S
1.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1456
2.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1620
4.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1712
5.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1914
7.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2020
8.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2128
9.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2349
11.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--
12.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0103
13.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0220
14.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0500
16.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0619
17.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0729
18.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0947
21.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1015
22.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
23.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1100
24.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--	1120
25.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1141
26.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1207
27.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
28.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
29.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30.	--	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0606	1416
31.			[illegible]	[illegible]			[illegible]	[illegible]	--	1608			0336	1506			0656	1505

TIMES OF MOON RISING AND SETTING
FOR LATITUDE 52
(April - December 1957)

IN G.M.T. [illegible], UNCORRECTED FOR BRITISH SUMMER TIME
(in hours & minutes)
Times for moon's upper limb

It is not possible here to explain the calculation for the error due to displacement from Latitude 52, and for places in the British Isles this will generally be found to be not worth worrying about. These tables should be of great value to those who undertake such night work, especially that involving the light or sugar-pot.

(A. E. S. [illegible] No. 161)
April [illegible]

Keep this in your diary for ready reference.

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY.

Vol.2 No.16 April 1937

HON. EDITORS:-
B. A. COOPER
A. N. BRANGHAM.

Dear Fellow Members;

This month we are carrying out a programme intended, if not to double, at least substantially to increase our membership. We have forwarded free Bulletins to all those names sent by members, and have also sent copies to other individuals and societies likely to be interested. The latter is more for the purpose of making our existence generally known than in the expectation of new members. It is very noticeable that the inclusion of a letter from one of the Secretaries with a free copy has an almost magical effect - 80% have joined us as against less than 10% when no letter was included. Even so, this is not bad showing. In order that each enquirer may therefore receive a letter, a stereotyped note is to be duplicated, while, in order further to save the Secretaries time, it is possible that another may be prepared to send to joining members. As the expense involved in printing and posting such free copies, letters and prospectuses is beginning to weigh heavily on the finances, we have decided, when advertising, to ask enquirers to enclose 3d. in stamps as part cost.

It has struck us that some people may be chary of joining because the present Committee is not known in entomological circles - yet! Although we have among us several personalities well known in the entomological world, it has been thought that such a one, as our President or Chairman, would help to give us a firmer official standing. Before, however, any President would take office it would have to be made clear that our organisation is on a permanent and secure basis. To secure this end, therefore, one or two additions may be made to the Committee in the near future, so that should one of these be unexpectedly compelled to drop out, the Society would suffer no ill consequences. No doubt we shall hear the views of others on these subjects in the near future.

In view of the exceptionally cheap rates offered to us by both our duplicator (Dennis E. Bollinger) and printer (C.E.C. Hewetson) we are offering both a free advertisement or distribution of their leaflets. In addition, the former has given the Society a free advertisement in his lists, so we are placing a note of his in our Wants & Exchanges column. Mr. Bollinger also offers our members who quote their membership number when ordering a special discount of 25% on set insects and 15% on ova, larvae, pupae and apparatus.

The A.E.S. has now applied for affiliation (by a donation) to the South Eastern Union of Scientific Societies. Although we understand entomology is not a subject for discussion this year, some member may care to attend the Conference (Hastings, June 8th to 12th) - perhaps he will communicate with B.A.Cooper. Again, some members may like to attend the Society for British Entomology's Congress at Reading University on the week-end of July 9th next - if so, will they please communicate with D.O.Boyd (No.54)

Wishing you all better weather this April than last year brought forth,

Yours sincerely,

B. A. Cooper
A. N. Brangham.

A SOUTH AFRICAN MIGRANT
Pieris "*spilleri*" (Lepidoptera: Pieridae)

Mr. H. M. Millar has kindly sent us the following brief paper on a number of migrating butterflies seen by him in North Zululand. Such records from abroad are of great interest in connection with the S.E.U.S.S. work on migration, and especially so as this species is not recorded as a migrant in the standard work on the subject, namely, "The Migration of Butterflies", by C.B.Williams (Oliver and Boyd, 1930, 21/-)

On February 1st, 1937, was observed a migration of *Pieris spilleri* at Hluhluwe, N. Zululand, where they were seen in great quantity flying due south and assisted by the wind blowing from the north east. They were flying in small groups of from about seven down to single specimens; the groups appeared to have a leader who was followed closely. From the specimens collected it appeared that the condition of the flies was fresh, and the insects might have been hatched the day before. Both sexes were present, though males were much more numerous that the females. The flight was rapid.

The migration seemed to me to be in thousands - they were moving towards Durban City, some 200 odd miles south. The heat has been unusually severe and maybe that accounted for the migration. I have not found them laying eggs at or near Durban, probably on account of the absence of food plant.

Males are bright lemon colour with a narrow dark tip to the upper wing. Females are dull light yellow. Dimensions of both sexes 1⅞ inches. This Pieris may be collected at Durban, Natal, in due course of the migration referred to herein.

Harold M. Millar.

Mr. Millar's letter concludes with an invitation welcoming any of our members who may be paying South Africa a visit to call at his house and learn of the local "flies", while he might possibly be of some help as a guide in the study of the wonderful wild life inhabiting those parts.

CALENDAR

We have this month appended to the journal a table of moon risings and settings in the hope that it will be a help to members in the arranging of their short summer holidays or week-end evening trips. This is not stapled in, so that it may be folded and placed in a pocket-book or collecting notebook. This should also be a reminder to members to fill in the phenological table as far as they can on the reverse side of the sheet.

Events in the Lepidoptera world during April and early May are very similar to those prevailing during the previous month; hibernated larvae are still plentiful if searched for at night. Sallows, especially in the more northern parts of Britain, are still in bloom, the Ground Sallow (*Salix repens*) being particularly productive when the larger species are over. My own experience with light is that it is, if anything, less productive numerically than during late March, but probably more species appear. It is a good plan to keep all females for mating and eggs - both sexes may often be sleeved with a sugar pad on their food-plant; this gives very good results, the young larvae being removed later as the food becomes exhausted.

Beating for larvae will not prove of much value, as they may be more easily obtained later in the season when large, although possibly more highly parasitised. Sweeping grass and heather after dark, however, will nearly always give good results. Hedgesides and patches of weeds, such as dock and nettle, are best looked over, but collectors of orders other than butterflies and moths will find sweeping anywhere and anything one of the most profitable modes of collecting, by day as well as by night. The net requires a strong stick about 5 feet long, which is not likely to snap on impact, while a strong linen (for example holland) bag is also a necessity. The ordinary cane ring soon perishes in the moist conditions of service required of it, so it is well to use one of metal - dealers supply these nets fully equipped at about 10/6 each.

Among larvae now about are those of the Brown Butterflies (Satyridae) (sweep at night in grass), the Fritillaries (*Argynnis*, *Brenthis*, *Melitaea*) (mostly on violets), The Purple Emperor (*Apatura iris*) (sallow), White Admiral (*Limenitis camilla = sibylla*) (on honeysuckle, especially near the ends of stems) and the Skippers (Hesperiidae) (on grasses at night).

WASPS IN NOVEMBER

B. A. C.

T. Bainbrigge Fletcher records the observation of worker wasps about on ivy flowers at Stroud, Glos., on Nov. 20th, 1936, and males of the same species on November 5th. He attributes this to the fact that no frosts had occurred during the autumn at this date, since one does not usually meet with wasps as late in the year as the above.

MIGRATION NOTES

We have received the following note from Rothamsted Experimental Station, Harpenden, Herts., relating to "Special Numerical Records of Regular Migrant Insects" (Forms for noting these may be obtained from B.A.Cooper):-

"On analysis, the records of immigrant insects already collected under the scheme initiated by the South-Eastern Union of Scientific Societies in 1931 are difficult to interpret for want of continuity of observation, probably due to casual observers losing interest in a migrant species after its first appearance and neglecting to report its presence as it became locally common. As a result, graphs constructed from the number of insects observed per day in different areas fail to distinguish variations in the numbers present due to movement from local emergences and broods dying out or going into hibernation. In order to have some control of local conditions, it is desired that the resident species, *Nymphalis io*, L., (the Peacock Butterfly), be added to species kept under daily observation in flower gardens.

"It is specially desired that County Recorders will enlist the services of a few reliable volunteers to record counts of each of the nine regular migrant species under observation, adding *N. io*, on each sunny day, preferably at the same time and place - such as a Buddleia bed in some easily accessible garden where attractive flowers are maintained continuously.

"In recording sudden increases or decreases, it should be noted whether a flight has been seen in any persistent direction, and observations on the preponderance of the sexes at various times would be useful. Reports in diary form should be sent in by November".

Should there be any of our members still wondering whether it will take up too much of their time to offer their services in the migration cause, may we point out that any observations, however incomplete or irregular, are of value. Migrants are not, like many species, confined to small localities to be visited at rare intervals. Migrations are just as likely to be seen in citystreets as elsewhere, but are more likely to be overlooked by the entomologist well trained to gardens, woods and fields. No wanderer will neglect a blossoming window-box or backyard flowering patch. The Red Admiral is frequently more common and more easily observed in suburban garden or Park than in open country. If any further information is required, please write to B.A.Cooper or Captain Dannreuther.

PHENOLOGICAL RECORDING

In spite of its formidable title, this is a subject that will interest a great majority of our members. It refers to the effect of various climatic and metereological conditions on life in general, and in our case, on insect life.

It has for long been realised that heat, cold, wet, drought, sun, cloud, high and low barometric pressures, phase of moon, and innumerable other factors affect life in many ways, but exactly how it was impossible to determine with any degree of accuracy without the aid of large numbers of figures to work upon.

Accordingly, Major H. C. Gunton, after consultation with Dr. Williams, Head of the Entomological Department of Rothamstead Experimental Station, selected 50 common species of Lepidoptera, and averaged up the dates of appearance of these from figures taken during several previous years by a few other observers. The table he drew up is given on one side of this month's supplement, together with a specimen record from Hastings last year, while a third column is left for members' own observations during the present year. Any further notes - the more the better - should accompany the form when returned in October or November.

Many interesting facts have already come to light as a result of these researches, and it is hoped that with an increased number of observers the results will be more conclusive as errors are eliminated. It is hoped to publish in the Bulletin in the near future an article or articles dealing with this subject so as to explain it more fully than we have space to do here.

The noting of dates of first emergence or observation of a species deals with one aspect of the subject. Another side, which has as yet been very inadequately investigated, is that of the causes of variation in relative abundance of a species, which does not, however, depend on metereological conditions alone. Figures will have to be collected over a great period of years, since many of the variations have a relatively long cycle. If any members would care to help, perhaps they would like to communicate with Major Gunton direct at c/o R.E.S., 41, Queen's Gate, London, S.W.7.

Those living in the country are obviously in a better position to help than we great majority of town dwellers, but that should not deter us. In the latter case, if observations are made without taking any of the specimens, either before or after counting, the results will naturally be more reliable. It must also be pointe out that the localities mentioned by observers are essentially confidential, and will not under any circumstances be divulged by the Phenological Committee unless requested.

It is hoped that members will respond to this scheme as well as they have to that dealing with migration, and help to make it a success.

B. A. Cooper.

WATER-BEETLES IN APRIL

Though water-beetles can be sought with success during almost any month in the year, April is one of the best months, especially for the genus *Haliplus*, before the insects enter on their larval stage. As usual, the best results will be obtained by collec in as varied habitats as possible; search should be made in ponds and other pools of standing water, streams, both slow- and fast-running, peaty pools and brackish water. Each of these habitats contains beetle species peculiar to it, so that at times a knowledge of this will materially help in identification. It should be remembered, too, that beetles are often extremely localised, being sometimes restricted to a few square yards of land or water, or even to a single tree; consequently, the search must be intensive and prolonged. It is worthy of remembrance, too, that prolonged search, even in one small pool, will still bring up new things. I remember *Dytiscus dimidiatus* and *Ranatra linearis* turning up after an hour's intensive work by two of us in quite a small pool at Wicken.

For nets it is essential to have strength above everything and this is where professionally-made nets are often deficient. My own net consists of a ring and ferrule that used to belong to a landing net. The handle went long ago and has been replaced by an ash stick cut from a coppice. The net is made of the stoutest embroidery canvas which the ladies use for "fancy work". It is sewn on to iron rings; these were originally intended for picture hooks, but the screw part has been removed. These slip on and off the ring for convenience of carriage.

In collecting, attention is first paid to the surface for Gyrinus spp. Next the net is used in the pond; it is worked along the edge among the weeds, and particularly to stir up the mud at the bottom. It is well to push the net outwards, pull it back rapidly, and then forward again to catch the beetles in the swirl. It is then well washed in the water and carefully examined at the edge. The search should be prolonged, for many species don't turn up at once, e.g., Macroplea,, and sometimes it is wise even to take the weed home for examination.

Next, the moss at the sides and bottom should be squeezed free of water and examined in the same way.

For working rapid streams for beetles such as Helmis, Hydraena, Limnius, etc., the following is an excellent plan. The net is supported across the stream where the current is rapid. Stones above it are turned over and rubbed; the adherent insect-life is thus removed and is carried by the current into the net. As the species are generally small, they need careful search.

Setting is carried out in the usual way after relaxing. If it is difficult to set the legs, etc., the beetle can be gently pressed back downwards into a slight hollow in a piece of plasticine, obtainable at any artists' colour shop. The appendages can be pushed out with a needle, and thus the specimen can be removed on a damp brush and set as usual.

Finally, with certain genera such as Gyrinus and Haliplus, especially of the ruficollis group, the aedeagus should be extracted and mounted with the specimen.

Geo. B. Walsh.

QUERIES

No. 31 H. E. Chipperfield and G. V. Day both ask whether it is necessary to stuff the bodies of the larger moths to preserve them in their best appearance. If so, how does one proceed? It is noted by one that out of a whole collection, several Sphingids only have turned greasy. Is there any treatment, apart from stuffing, which satisfactorily prevents this? And lastly, do stuffed specimens ever go greasy? Few textbooks, including Richard South's popular work give details on stuffing, while the Editor's attempts in this line have managed to produce wonderful shapes in distended, shrunken and hairless abdomens. In partial reply to the last question, the object of stuffing thorax and abdomen is to remove the insect's entrails, including the fat-body, from which the grease is presumed to emanate. Again, expert advice is needed on this subject.

No. 32 Can any member explain how the skins of green larvae, such as Dicranura vinula (Puss moth) and Sphinx ligustri (privet hawk) may be presevred in their natural colours? I have fairly successfully preserved quite a number of hairy larvae, but with D. vinula there appeared to be two skins - a transparent outer skin and a coloured inner layer. The latter, in my attempts, invariably came out or shifted when the inside was extracted. I have, however, seen these particular larvae perfectly preserved in various collections and should be very grateful to any member who can explain the secret of success in this rather tricky procedure. B. U. Fox.

No. 33 T. D. Fearnchough writes that he has a specimen of a Small Copper Butterfly (Chrysophanus phlaeas) with only two black spots on the underside of the forewing, the other rows of spots being missing. The upperside is normal. He asks whether this is a named variety, and if so, what it is called.

REPLIES TO QUERIES

No. 27 My reply to this query about laying out a garden at Dorking to attract butterflies, etc., is that three years ago I induced the Parks and Gardens Superintendents of six provincial cities to lay out butterfly beds of large size. The best results in attracting Vanessids and Plusia gamma in autumn are obtained by Buddleia davidii (variabilis), Coltness Gem single Dahlias (yellow, red and mauve), Sedum spectabile, and many kinds of Aster or Michaelmas Daisy. To attract the Blues and the Whites, Lavender is best, and for Hawk-moths Tobacco plants (Nicotiana affinis is white and scented - hybrids are not). When these are over, ivy blossom is attractive, and also jasmine in spring. Amongst semi-wild plants Kentranthus ruber (Red Valerian), Centaurea nigra (Hardhead), Escallonia and privet in flower are attractive. The point to remember is that bess quickly suck out the nectar and that cutting out the spent blooms, and especially with Buddleia, induces longer and better flowering.

The nearest butterfly garden to Dorking specially designed for this was made by Mr. R. C. Dyson, when foreman of the Dyke Road Public Gardens near the Booth Museum (enquire of Major H. Blackiston) Brighton. Here a quarter of an acre of Buddleia are kept at 4 ft. with a stand to watch from, and there are long borders of Lavender and Tobacco plants - the latter are cultivated in mass in a garden at Polegate to attract Herse convolvuli (Convolvulus Hawk), which are very numerous in some years at Nicotiana affinis. (In September and October 1933 J. P. Lloyd reported there).

At the Castle Gardens, Leicester, 200 yards of J. H. Jones Yellow Dahlias held hundreds of butterflies in September 1935, and Stanley Park similarly in September 1936 (see page 8 of reprints from the "Entomologist"). There are similar Dahlia beds at Colchester Castle, Nottingham, Hastings and the London Zoo. Butterflies are not attracted to double Dahlias, Buddleia globosa, mauve Veronica (but will go to the blue-spiked flowers), and gardeners often make mistaked in planting the wrong varieties or colours. When other flowers are not available they will go to Cotmints (Nepeta spp.) and in the wild to Malva (Mallow), Thistle, Bramble, Silene maritima, Scabious, Hemp Agrimony, Viola and even Dandelion.

So you can pick what you like, but, of course, this feeding habit has nothing to do with resting quarters or food-plant for the larvae. This latter can be got from F.W.Frohawk's "Complet Book of British Butterflies" (Ward Lock, 1934, 10/6), on pp. 32-4, the best book of its kind available.

T. Dannreuther.

WANTS AND EXCHANGES

The Keeper of the Department of Entomology, British Museum (Natural History), Cromwell Road, London, S.W.7, states that his Department is most anxious to obtain parasites, and particularly hymenopterous parasites bred from known lepidopterous hosts. Anything of this kind members care to send should be addressed to J.F.Perkins, Dept. of Entomology, etc. Since so many thousands of these are bred annually, to the great annoyance of the breeder, we feel that members should make an effort to send any that come into their hands, accompanied, whereever possible, by full data, to the British Museum, where they will be of the greatest scientific value.

The Department is also trying to build up a collection of lepidopterous larvae in spirit, and would be most grateful for any help which members might be able to give, and particularly with the more local species in any stage. These should be addressed to N.D.Riley personally, preferably alive, as this overcomes the difficulty of sending spirit material through the post. As a further encouragement to members, other than the thought that their gifts to the Museum would be to the benefit of science in general, the Department has large quantities of duplicate insects of all orders, largely foreign, which, if desired, they would be glad to let members have in exchange for parasites or larvae. Postage will be refunded, if required.

Wanted by Dennis E. Ballinger, Entomologist, Room C, The Cottage, Canham Road, London, W.3.:- Living fertile females of practically all British Lepidoptera. Postage will be refunded and a credit note sent for any which are of use.

G. Burt (No.48) has as duplicates a few set specimens of: Red Admiral (atalanta), Painted Lady (cardui), Grayling (semele), Speckled Wood (aegeria), Clouded Yellow (croceus), Oak Eggar (L. quercus) and Drinker (potatoria).

L. R. Tesch (No.1) wishes to dispose of a collection of British Butterflies and Moths. He emphasises that it is very much of a beginner's collection, and contains no rarities. He wishes to exchange it for postage stamps.

B. A. Cooper has live larvae of Aplecta tincta (Silvery Arches) for exchange. Wanted:- other larvae, especially those of the Arctiidae (Tiger Moths) (except A. caia)

J. P. Robson (No.44) would like to exchange "duplicate" and "desiderata" lists of Lepidoptera.

oOo oOo oOo oOo oOo

MEMBERSHIP CHANGES

NEW MEMBERS

No. 62: I. P. Russell, 1, The College, Malvern, Worcestershire. (Lepidoptera)
No. 63: Hugh Main, B.Sc., F.R.E.S., F.Z.S., 9, Woodside Road, Woodford Wells, Essex. (Lepidoptera, Coleoptera, Nature Photography)
No. 64: H. E. Chipperfield, Dorowyn, Froules Road, Dovercourt, Essex (Lepidoptera, Hymenoptera)
No. 65: Dr. O. H. Koenigsberger, St. Jospph's Haus, Davos, Switzerland (General Entomology)
No. 66: B. N. Dovetil, Littlefield, Marlborough, Wilts. (Lepidoptera, Coleoptera)
No. 67; D. A. B. Macnicol, 52, St. Alban's Road, Edinburgh, 9. (Lepidoptera, photography of larvae)
No. 68: T. Norman, Meadowside, Andover Road, Newbury, Berks. (Lepidoptera, General Entomology)
No. 69: R. S. Adshead, 37, Elms Drive, Bare, Morecambe, Lancashire. (Lepidoptera, General Entomology)

PRESENT MEMBERSHIP: 64

oOo oOo oOo oOo oOo

COLLECTING LEPIDOPTEROUS LARVAE AMONG HEATHER

While on the north Yorkshire Moors during August 1936, I found the following methods of collecting larvae from heather very productive:-

1) Searching:- This slow and very tedious way was successful at all times of the day. The larger larvae (L. quercus var. callunae - Northern Eggar; S. pavonia - Emperor; M. rubi - Fox) were always taken in larger numbers when the sun was shining; they showed up conspicucusly on the non-reflecting foodplant, often resting on top and were more noticeable if one walked with back towards the sun. During dull periods practically all were to be

[illegible] resting half-way down the stem and seldom moving. The taller clumps of old heather were the most productive for all species, [illegible] being rarely [illegible]. The caterpillars were more difficult to detect, however, among very thick masses of calluna and erica.

2) Sweeping:- This method was most profitable after darkness had set in, when several species of geometrid and small noctuid larvae were to be swept into the net while feeding on the tips. During the day practically the only species taken in this way were M. rubi (young); A. myrtilli (Beautiful yellow-underwing) and small [illegible]. Sweep the net lightly to and fro over the tops of the heather, not too heavily as this will collect too many dead flowers and leaves or crush the larvae, and not too slowly, lest the larvae should fall outside the net; the correct speed will soon be learnt by practise. Walk slowly forward through the heather keeping the ring of the net almost perpendicular to the moor-top. The larvae, once in the net will not fall out again, however many bumps and jars may occur when woody particles or rocks are met with.

3) Beating:- Pull the netting of an ordinary butterfly net tightly across the ring so that a flat even surface is obtained on which to collect the beatings. This may then be easily inserted (minus stick) under tufts of tall heather, especially where they overhang ledges, the larvae being jarred off the heather with the hand. I find this method far more convenient and almost if not equally as successfully as the standard way with beating tray or sweep net. Even newly-hatched larvae seldom seem to fall through the meshes of an ordinary net. The presence of the larger larvae in the near vicinity can very often be detected by the finding of frass or the cast off sking among the matter collected in this way. The area for several feet around should be very carefully examined for the culprit if he is not found immediately above. If the sun is or has recently been shining it will be found a good plan to give special attention in this direction whither the caterpillar may have moved in order to get a good position for sunning itself.

All heather-clad moorland appears to have its attendant lepidopterous population. As stated above, taller plants, even if widely separated, appear to have a larger proportion of inhabitants than shorter patches. Consequently, both low moor and the uplands do not seem so profitable as the typical high moor, though grass-feeding species will be found here to be correspondingly more plentiful. I have found the areas alongside roads, paths, gullies and becks to be the best places of all, but perhaps this is only because they are more easily searched and beaten than elsewhere. Exposed windswept hillsides, as would be expected, are not as good as sheltered valleys, but the difference is not great.

During my peregrinations on the moors I cam across large numbers of insects of other orders than lepidoptera, especially homoptera, heteroptera, coleoptera and hymenoptera, and also many species of spider. These should add interest to the outings of every entomologist, but I fear that in many cases the opposite effect is obtained - by making them feel what a little there is on the moorlands that they understand and feel to be worth their leisure. Perhaps this may induce our coleopterists and collectors of other orders to write similar articles in future Journals on their own interests. We have as yet heard very little from these members.

B. A. Cooper.

oOo oOo oOo oOo oOo

ADVERTISERS' ANNOUNCEMENTS.

[illegible] reserved for members' advertisements (not exchanges), [illegible] notices, e.t.c., at cheap rates. For advertising rates, [illegible] to the ADVERTISING MANAGER, Mr. A.N. BRANGHAM, 160, [illegible] HILL, BELSIZE PARK, LONDON, N.W.3. (Telephone number [illegible] 5[illegible]59). Advertising 'copy' should be sent to Mr. Brangham by the 20th. of the month before the next issue of the Bulletin is published.

oOo

I.P. Russell (No. 62), 1, The College, Malvern, Worcs., has for sale or exchange an excellent collection of eggs of British resident and migrant birds, both rare and common. Some very nice sets of the Scolopacidae, mainly migrants, birds of prey, and vagrants such as the Greenland and Iceland Falcons. These in a six-drawer cabinet, good condition. Low prices, for clearance.

BIND YOUR BACK JOURNALS AND BULLETINS. Sturdy, stiff covered, spring-back binders, price 2/8 post free. From B.A. COOPER, 61, Okehampton Road, London, N.W.10.

PRINTING

ALL STYLES OF PRINTING
Notepaper,
Visiting Cards,
Circulars,
Tickets, etc.
AT REASONABLE PRICES
SEND FOR SAMPLES TO; C.E.C. HEWETSON, 38, Beechcroft Gardens,
Wembley Park, Middlesex.
PRINTER OF THE SOCIETY'S STATIONERY
COVERS & PROSPECTUSES.

A.N. Brangham(No. 18), 160, Haverstock Hill, London, N.W.3., has the following entomological books for sale:-

"THE STANDARD NATURAL HISTORY" edited by W.P. Pycraft, Warne, 1931, 942 pp. illustrated. A standard reference book. List price 15/-. PRICE..........10/-.

"THE GUESTS OF THE BRITISH ANTS" by H. Donisthorpe, Routledge, 1927, 244 pp. Illustrated. The most complete book on this subject by the leading English authority. This book is a supplement to his "British Ants." Published Price 10/6. PRICE.........4/-.

"THE SOCIAL WORLD OF THE ANTS" by Auguste Forel, Putnam, 1928, 2 vols. Vol. I. 551 pp., Vol. II. 445 pp. The most complete work on the social organisation and development of ant colonies, by one of the greatest entomologists. Published Price(2 vols.) £3.3.0. PRICE...........£2.0.0.

"BEES, WASPS, ANTS, AND ALLIED INSECTS OF THE BRITISH ISLES" by Edward Step, Warne, "Wayside and Woodland Series", 1932, 238 pp. An excellent reference guide to the Hymenoptera, by one of our most popular writers. This was his last work. Published Price 7/6. PRICE..................4/6.

"BRITISH BEETLES" by Rye & Fowler, Reeve, 1890, 280 pp. This book is now out of print. The illustrations are still unsurpassed. Published Price about 10/6. PRICE.........3/6.

"COMMON BEETLES OF OUR COUNTRYSIDE" by W.E. Sharp, Partridge, 342 pp. A guide book for the young collector and beginner. Published Price about 5/-. PRICE.........2/-.

"BRITISH BEETLES - THEIR HOMES AND HABITS" by Norman Joy, Warne, 143 pp. 268 illustrations, 1933. A concise reference book for the young collector. Published price 5/-. PRICE.........2/6.

When ordering, please enclose 9d. for postage.

THE
ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF
THE AMATEUR ENTOMOLOGISTS' SOCIETY

REGISTERED

OL. 2 NO. 17 PRICE SIXPENCE May 1937

CONTENTS

TITLE	AUTHOR	PAGE
ditorial	Eds	36
n Collecting	A. N. Brangham	37
he Effect of Cold on the Habits of Ants	D. J. Billes	42
ook Reviews	A. N. Brangham	42
alendar	B. A. C.	44
ome Points on the Pupae of the Large hite Butterfly	Hugh Main	45
uery No. 34	S. G. Abell	46
No. 35	M. A. Rollason	46
ants & Exchanges		46
embership Changes		47

Bulletin No.18 will be published towards the beginning of June.

COMMITTEE

HON. SECRETARY & EDITOR:-

B. A. COOPER,
61, Okehampton Road,
London, N.W.10

To whom all matter for the Bulletin should be sent.

ON ASSISTANT SECRETARY

C. H. Veale,
8, Hurst Road,
Bexley, Kent.

HON. EDITOR

A. N. Brangham,
160, Haverstock Hill,
London, N.W.3.

Published by the Society in London.

THE ENTOMOLOGISTS' BULLETIN

is published nine times per year by the

AMATEUR ENTOMOLOGISTS' SOCIETY

The minimum annual subscription to the Society, includin the year's Bulletins, is:-

Great Britain, Empire & U.S.A. ...	3/6 post free
Other Countries	5/- post free

This should be sent to the Hon. Treasurer, B. A. Cooper, at 61, Okehampton Road, London, N.W.10, Postal Orders may be made payable at Kensal Rise, N.W.10, Branch Office.

The Hon. Secretaries will be pleased to forward a specim copy of the Society's journal and a prospectus to any non-member like to be interested, on receipt of name and address. They will also gladly send prospectuses to those members who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage. If contributors desire return of their manuscripts after publication, would they please mention this when writin and also enclose the required postage stamp.

The exchange colum is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting many years are advised to confine themselves to the exchange of ideas, apparatus and live insects, leaving that of set, pinned and unpinned specimens till they have had more experience. It may be added that the Editors offer no guarantee for any articles offered herein, and they are in no way to be held responsible should the privilege allowed be abused. Unless they are informed otherwise exchange notices will be inserted in the Bulletin once only. For addresses please refer to the membership list and subsequent membersh changes list.

Anyone at present not recording migrant lepidoptera and dates of first noting the species on the phenological list each year, who would care to note down and report anything connected with these subjects that he might observe, should write to B. A. Cooper or C. H. Veale for free literature and information.

If there are any members living abroad or in the province who are in the unfortunate position of not always being able to get t book they desire, we shall be glad to order it for them, postage bein additional to the published price.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

although of interest to all amateur collectors, sets out to assist in every possible way the less advanced collector and student of entomology. Beginners are especially welcome.

ADVERTISERS' ANNOUNCEMENTS.

This page is reserved for members' advertisements (not exchanges), dealers' notices, etc., at cheap rates. For advertising rates, apply to the ADVERTISING MANAGER, Mr. A.N. BRANGHAM, 160, HAVERSTOCK HILL, BELSIZE PARK, LONDON, N.W.3. (Telephone number PRImrose 5559). Advertising 'copy' should be sent to Mr. Brangham by the 20th. of the month before the next issue of the Bulletin is published.

* * *

H.K. LEWIS & Co. Ltd.
PUBLISHERS & BOOKSELLERS.

SCIENTIFIC BOOKS

ENGLISH and FOREIGN books on the Biological Sciences can be supplied from stock, or obtained promptly to order.

CATALOGUES are issued, and will be sent post free on request.

SECONDHAND BOOKS in all branches of science are available at the Second-hand Department, 140, Gower Street. Catalogues and quotations on application.

LENDING LIBRARY

The Scientific Library lends books on the pure and applied sciences.

THE ANNUAL SUBSCRIPTION is from one guinea.

BOOKS may be retained as long, or exchanged as often as desired. New books and new editions are added as soon as published.

DETAILED PROSPECTUS will be sent post free on application.

H. K. LEWIS & CO. LTD. 136 GOWER STREET,
LONDON. W.C.1.

* * *

A.N. Brangham(No. 18), 160, Haverstock Hill, London, N.W.3., has the following entomological books for sale:-

"THE STANDARD NATURAL HISTORY" edited by W.P. Pycraft, Warne, 1931, 942pp. illustrated. A standard reference book. Published Price 15/-. PRICE...10/-.

"THE GUESTS OF THE BRITISH ANTS" by H. Donisthorpe, Routledge, 1927, 244pp. illustrated. The most complete book on this subject by the leading English authority. This book is a supplement to his "British Ants". Published Price 10/6. PRICE...........4/-.

"THE SOCIAL WORLD OF THE ANTS" by Auguste Forel, Putnam, 1928, 2 vols. Vol. 1. 551 pp., Vol. 2. 445 pp. The most complete work on the social organisation and development of ant colonies, by one of the greatest entomologists. Published Price (2 vols.) £3.3.0. PRICE........£2.0.0.

"BEES, WASPS, ANTS, AND ALLIED INSECTS OF THE BRITISH ISLES" by Edward Step, Warne, "Wayside and Woodland Series", 1932, 238 pp. An excellent reference guide to the Hymenoptera, by one of our most popular writers. This was his last work. Published Price 7/6. PRICE........4/6.

"BRITISH BEETLES - THEIR HOMES AND HAUNTS" by Norman Joy, Warne, 147pp. 268 illustrations, 1933. A concise reference book for the young collector. Published Price 5/-. PRICE........2/6.

When ordering, please enclose 6d. for postage.

BIND YOUR BACK JOURNALS AND BULLETINS. Sturdy, stiff covered, spring-back binders, price 2/8d. post free. From B.A. COOPER, 61, Okehampton Road, London, N.W.10.

WILL ALL THOSE MEMBERS who are interested in the possible effects of certain electrical rays on insects either in the egg, larva, or pupa stage, please communicate with A.N Brangham (No. 18), 160, Haverstock Hill, London, N.W.3. Mr. Brangham has a mercury-vapour (quartz) lamp, which is used for therapeutic purposes, and he would like to co-operate with members in making records of the influence of these rays on insects during metamorphosis. A nominal charge to cover the cost of the electric current used would have to be made.

oOo

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

[illegible] May 1937

HON. EDITORS:-
B. A. COOPER
A. N. BRANGHAM.

Dear Fellow Members,

Events to report this month are several but not startling. The chief item is the purchase, thanks to one of our members, of a duplicating apparatus for the sole use of the Society. It is proposed that we should buy this duplicator from him eventually, at cost price (wholesale - £6: 12: 6) by laying aside a sum each month, this "profit" being calculated from the price paid formerly for duplicating. As this would amount to little more than two or three shillings per month, we are going to place all donations, until further notice, into a special duplicator account. Perhaps this may alsu act as a slight inducement to some to help us pay off the debt in as short a time as possible. A complete list of donations will be published at the end of the season.

Our member, Mr. E. J. Jones, himself a headmaster, has pointed out that even our low subscription of 3/6 may be outside the financial range of many enthusiastic young naturalists, for whom we endeavour to cater. This we fully appreciate, and we have consequently entered into financial considerations concerned in detail. The most satisfactory scheme, to our mind, is a special cheap edition to members of school natural history societies, on cheaper paper, without the Society's present cover, and with other economies in various directions. We think this could be produced, with very small loss to the Society, at an inclusive charge of one shilling per year per junior member. We have not yet, however, experimented with duplicating on the thin tissue paper such as that which was used on the back of the February Bulletin, in any case oneone side. The other suggestion, less satisfactory in many ways, but the only one practicable at present, is that the Society at the school concerned should itself become a member, placing the Bulletins in the library. Further copies of the Bulletin could be obtained at special rates and shared between the pupils at the discretion of the master in charge.

A "good" magazine, we are told, should receive three or four times as many articles for puplication as it really needs. Whatever adjectives most aptly describe our efforts, it is to be hoped that every member will bear in mind the above maxim, and endeavour to increase both our sales and our thickness. Although we are still not offering a prize to the member who introduces the largest number of new members in the course of a year, we would appreciate it if members imagined that this was really the case. Perhaps we may here point out that we have found it necessary to close the Bulletin for publication a month before its issue. Exchange notices are given another fortnight before closing for the next issue. Again, if contributions are not inserted immediately, it does not necessarily imply that we have enough "copy", as we must always bear in mind both the succeeding numbers and the even spacing of those in immediate preparation. We do not consider it necessary to publish a list of those from whom correspondence has been received. Any points which we believe to be of general interest to most of our members will be published from letters to the Editors, unless instructions are given to the contrary.

May we thank those amongst us, both new and old members, who have so kindly written to tell of their entomological adventures and discoveries, and who have supplied the information for the benefit of the whole Society.

Yours sincerely,
B. A. Cooper
A. N. Brangham.

ANT COLLECTING

These few notes are directed chiefly to those followers of the net who have reached the stage of finding that their interest in the lepidoptera has slackened somewhat, either because of many years study in this department of entomology, or because their collections have become sufficiently replete, andthe scope of their studies of butterflies and moths is necessarily more limited. Most important class of all, perhaps, is the young beginner who wonders whether it is more fun to collect lepidoptera, in which subject he can certainly make many friends, or whether he should branch out into something which is not quite so stereotyped, such as investigating the coleoptera or formicidae.

These notes, then, are intended as advertisements and propoganda for the latter branch of entomology.

Ant-life forms the most complex structure of the insect world, as it is closely related to the better-known insects, the bees and wasps, whose social organisations need not be repeated. The ants, however, are at the head of the hymenoptera, to which the bees and the wasps belong as well, in social structure and in plasticity of habit formation, and indeed, the ants rank fairly closely to the higher animals such as dogs, apes and horses, according to many scientists, but, as Dr. Juliam Huxley so rightly points out, the ants are at the top of their evolutionary ladder, and most other animals, certainly including man himself, are only just stepping on to the first few rungs. Many species of ants show a marked degree of degenerated, parasitic forms of life, and there is a species in England which is so far declined as to have lost all its social instincts altogether.

It is impossible to describe all of the forty-odd species which can be found in this country; I will pick out those which are commonest and those which are most interesting, as regards their mode of life.

You can find ants everywhere, in fields, in woods, heaths, cliffs, refuse-heaps, in houses (unfortunately!), in gardens, in railway embankments, in fact everywhere where there is either a little soil, some food available, or a small hole in which to make a nest.

Males and females pair off during the summer months. You have probably often seen these marriage flights, when thousands of males and females surge out of tiny cracks in the ground and fly up into the air - particularly on hot, windless days. They pair off in the air, and then drop to the ground. In most species the males dieeoff soon, and the females are left to found new nests by themselves. The females search out a suitable spot, bite off their wings, and lay the first batch of eggs. The object of biting off the wings is to store up fat, as the female has to live through the winter alone and attend to the brood, which takes up a great deal of energy, with the result that the first brood are usually distinguishable by their small size. The muscles which were connected to the wings degenerate quickly into fat tissues to nourish the female. The workers emerge in the spring - just a few of them, and they now attend to the female, whose sole duty from now on is to lay eggs. A second brood emerges in early summer.

The metamorphosis of the ant is similar to that of the lepidoptera, in that the female lays the egg, which develops into a larva, and this, in turn, turns into a pupa - some species weavin a cocoon for themselves, and others remaining naked - and the final perfect insect is the last stage.

Thus a colony gets going. After a short time all sorts of guests arrive (see my article on the guests of ants in Journal 12), some being parasites and others employing a system of barter, by which they give their sweet excretions to the ants in exchange for safe lodging and food. These guests range from aphids to spid from beetles to grass-snakes, but perhaps the most interesting relationship is that of the "Blue" butterflies and *Myrmica laevinodis*.

We will now go on to describe a few of the most outstandi species to be found in this country.

The most interesting species in the first category, namely the agriculturists, is the common Yellow Meadow Ant, Acanthomyops flavus. This is the well known ant which raises the green hillocks in every moist field. Its colonies are usually extensive. The members of this species are not very robust, and their spend most of their time underground - hence their light yellow colour. Their movements are sluggish, and, unlike so many members of the ant world, they dislike fights. It is common knowledge that ants are the most noteworthy examples of the [illegible] colonies whose slogan is, "What I have I keep" but Acanthomyops flavus is an exception. It may be called the farmer ant. It is much more of a vegetarian than most species, and is the [illegible] in that it is the most highly developed ant in the technique of keeping 'milch-cows' or aphides, better known as plant-lice or green-flies, of which there are a great many species in this country. Proper stables are built round stalks, roots and leaves, and a constant watch is kept by the ants to prevent a stray lady-bird (Coccinella bipunctata), from emptying the stable at one fell swoop. The Acanthomyops collects seeds into granaries, and, here again, there are always workers to see that the seeds do not turn mouldy. The nests that are frequently seen in fields are more often than not all members of the same colony, which means that many years previously a female founded a colony and the nuptial flight of each year did not extend far, so that each colony is a daughter of one founder colony. Consequently the millions of ants all living together in the same field are on very good terms with each other, and they are so phlegmatic that even when a strange species founds a nest in the same area, the Acanthomyops does not go out of its way to remove the intruder, unless, of course, the latter has direct designs on one nest. The Acanthomyops will fight them, and very often win through sheer weight of numbers. It is amusing to watch ten or more of these little ants holding on grimly to the legs and antennae of another species, and never letting go. I have never seen such a prolific egg-layer among the British species as the female of Acanthomyops flavus; if you open up a nest in early summer you come across chambers and chambers packed full of larvae or pupae, and then, if you open it up again a few weeks later, there will be thousands of young males and females, all rushing madly round the galleries, waiting for the nuptial-flight.

The near relative of Acanthomyops flavus is A. niger, which is a robust, open-air ant, and is coloured a deep brown. This species also makes its nests in fields, but not nearly as conspicuously as flavus, as the hillocks are much smaller, and they do not permit the grass to grow on the nest as does flavus. Instead, the soil is separated into tiny granules, so that, on looking at the nest, one would think that the soil had been put through a very fine sieve. More often than not niger builds its nests near trees, and the insects run over the whole tree in search of caterpillars and other food.

The other Acanthomyops of importance is A. fuliginosus, the jet black ant which builds big colonies in the shade of trees, and which are noted for their habit of sending out armies of ants in straight lines, along their set arterial roads, in search of food. These ants, too, cover trees all day long, and even along the bark of trees they go in columns. These ants are fine fighters and are bigger than either niger or flavus. The first two mentioned are easy to keep in captivity, but I have found great difficulty in keeping fuliginosus for any length of time.

We now turn from the comparative pacifists to the blatant marauders. We visit a nest of the common species, Formica rufa, that virile, chestnut-coloured ant which makes its nests of pine needles and is found so much in the pine woods of Surrey, Kent and Hampshire in the south, and in Scotland. This is a large ant, and it makes large nests. This species is a sun-worshipper. In early summer, when we have the first really hot days, you can see hundreds of thousands of ants sitting on the cone of pine-needles sunning themselves. They all seem to be dead. Then, if you pass your hand over them, the shadow which you cause will make many of them start up and the signal is passed round that there is an enemy, and the whole nest seethes, and by seething I mean literally, because these ants always make a great deal of noise with their comparatively heavy bodies and legs as they run over dry heather, leaves and pine-needles. The slightest movement makes these ants rush about in apparent aimless directions. It is almost dangerous to walk very close to a large nest. There is a ceaseless coming and going of these insects, and once their mandibles are attached to the skin it can be quite painful. Also, these ants can squirt formic acid, which is acrid and strong, for a good few inches into the air. Their mobile abdomens are suddenly tucked under and up, and they squirt while standing on four legs. I remember once opening a nest, and thinking I had spotted the female, which is always hard to find, I bent down close to confirm my suspicions. Suspicions or no suspicions, I suddenly lost my breath and started to reel backwards, my lungs filled with the acrid acid and my skin burning. A little while afterwards my skin peeled off. In the tropics where the same thing occurs, only more violently, people have been known to die in this way. *Formica rufa* can claim the largest number of guests of all British species, but it does not attend aphids with regularity. There are one or two species of ants which live with *rufa* as marauding parasites; when a *rufa* "nurse" carries a larva along the passage, an ant will dart out of a tiny channel in the wall and seize the larva, and make off with it and eat it. It is impossible for the *rufa* to catch the thief, as the galleries of the thieves are extremely small.

One of the most interesting ants in the world is closely related to *F. rufa*. It is the slave-making ant, *Formica sanguinea*, which means *Blood-red Ant*. This species cannot live without slaves; it has reached such a stage of degradation that it cannot feed or wash itself without its slaves, and the only remnant it has left is that of a courageous fighter. The slaves invariably belong to the same species of ant, *Formica fusca*, the Ash-grey Ant. The workers of *sanguinea* attack a *fusca* nest and carry off the other workers with their eggs, by gripping the thorax with the mandibles. The *fusca* seem to accustom themselves to the slavery and do everything that is expected of them, but the *sanguinea* do not allow them to fight. I have seen, on one or two occasions, an attack on a *fusca* nest, but the *fusca* came out in such hordes that the *sanguinea* were beaten off with heavy losses. It seems strange that a virile type like *F. rufa* should be so closely related to one of the most degenerate types in the ant world. In *rufa* one can see many likenesses to human activities - the way in which one worker will call another if she wants her back scratched, or they will have mock fights. It does not require much imagination to notice the obvious enjoyment with which an ant rolls on the ground while she is being washed by a fellow-worker. The *rufa* ants have their cemeteries where they bury all dead, and all refuse is put on to a refuse dump. *Rufa* seems to have a very good knowledge of medecine, as fellow-ants are either destroyed if they are too injured, or else they are attended to during sickness. If the female should be injured, however, she is always looked after, and even after death they will drag her round from place to place. But *sanguinea* does none of these things.

The next ant which we visit is very rare, and is the most degenerate ant known. In fact, it is so degenerate that it was classed among the *Mutillidae* or Solitary Bees until comparatively recently. This ant is called *Anergates atratulus*. There is no worker. The male and female are deformed, the abdomen of the male curving round and almost touching the thorax. When the female is laying eggs her abdomen swells up to a huge size. They are parasites on *Tetramorium caespitum*, a very pretty little ant found commonly in the New Forest. *A. atratulus* is found only in this district. Neither male nor female can eat by itself, and both have to be licked and carried by the hosts. Only recently has it been found out exactly how the *atratulus* female becomes accepted by the *Tetramorium* hosts. What happens is that the female enters the *Tetramorium* nest, and strangely enough, from experiments carried out in this country and in America by Wheeler, the female *Anergates* is generally favourably accepted by the *Tetramorium* workers, although at first she may have a little bout of wrestling with a worker. They carry her right into the nest, and here she sets about the business of finding the *Tetramorium* female, or rather, the queen-mother, who lays all the eggs. This she does, and a battle royal ensues. If *Anergates* emerges victorious she is accepted as the legitimate queen of the colony, and is treated as such. She climbs on to the back of the *Tetramorium* queen and attempts to saw her head off. Even when the *Anergates* kills the queen, other *Tetramorium* lay eggs to propogate the species, while the marauding female lays only males and females of her own species. It is evident that the *Anergates* invader is successful in only a few instances, as the number of *Tetramorium* colonies in the New Forest is tremendous - I have counted as many as 200 at Beaulieu Road Station alone, while it is very seldom that one has the luck of capturing *Anergates*.

I think I should mention one more interesting species which is now considered a British species, although it came to this country originally from more tropical regions than ours. This is *Monomorium* *Pharaonis*, the Pheroah Ant, a tiny, dirty yellow species which constructs nests in houses, and it is almost impossible to dislodge them. They propogate in countless thousands - one patient observer tried to count a nest full emerging to some syrup he had placed on the table; the story runs that he got tired after counting over 2,000,000 workers, 2,000 males and 500 females; he believes there were plenty more to come! There is no doubt that this ant may be placed among the pests in any country. It has been brought here by trading ships, and this species is so hardy that it can found a colony anywhere, provided that there is a fertile female. In this species, copulation takes place inside the nest, and not on the wing. *Monomorium* cannot be kept in captivity.

Apart from the forty-odd British species, there are another 80 or so species of ant which have been imported from the tropics, which dies out, and perhaps crop up again when another boat load brings a colony over; some persist in different parts of the country for many years. Most of the foreign species are found in ports, many coming over on bananas - I myself have found at least four different species of ant this way, but I have found that the majority of foreign ants listed (Saunders & Donisthorpe) may be found at Kew Gardens, Surrey, and I have spent many pleasant afternoons perspiring in the Propogating Pits and Hot-houses there, and have been able to count between twenty and twenty-five different tropical species, totally different-looking from our types; some of them had grotesquely long legs, others were coloured green, others were so small that they could only be seen through a magnifying glass. The most interesting one I discovered there was *Solenopsis geminata* which comes chiefly from South America and has a sting which is quite painful. It is known as the "Fire Ant". This Ant has often killed natives and white men in those regions, as a few hundred ants all biting and stinging at the same time, bring about unconsciousness and, finally, death. *Solenopsis geminata* has a close relation in this country in *S. fugax*, found chiefly in the southern counties, more especially Essex, on the lower Thames reaches. These tropical ants were found three or four years ago; recent visits have confirmed my fears that the British Museum (Natural History) authorities had been hard at work to clear away the pests, so that now we are lucky to find a solitary ant strolling along a palm leaf in the Temperate House.

I personally think that collecting ants is more fun than lepidoptera - I write this in spite of the protests of my co-editor - but my reason is that not only are ants commoner than lepidoptera, but that even if one comes across the same species in a locality, there is always an infinite variety of things to study in each nest. The one drawback is, I admit, the possibility of a backache after a few hours work in the fields. One can make good friends with an ants' nest. I have known one for the last nine years at Weybridge, Surrey, and another for five years at Merstham, Surrey. If they are not disturbed too much nests remain in the same spot for many years, as we have no vagrant, homeless species in this country.

The apparatus required for collecting depends on what one is out for. If you want whole nests, then you have to arm yourself with large metal tins, but if you only want, shall we say, one female (fertile), and a few workers, then a few test-tubes or glass-topped tins is all you need for holding your prizes. A trowel and sometimes a saw (for bark and rotten stump sawing) is essential. If you enter for the test-tube method, a large white sheet is a great help; you can tip the whole nest into the sheet and see everything which crawls off; this is particularly important if you collect ant guests, and now is the time of the year to begin this with success. Notes of locality, species, position of nest, type of soil, weather conditions, should be kept, these remarks being entered up on the spot.

If you want to keep the ants as they were in the open, or at least as near as possible, I advise you to put them into a disused aquarium, first putting in a few inches of sand before tipping in the nest. It is always best to put the queen in a test-tube by herself when taking the nest, or else she may become damaged or squeezed to death by the weight of earth. She can be put back with the nest when the workers have settled down and constructed roads again. On the other hand, if you wish to keep the ants alive, but wish to see more of their way than you would do with an ordinary box nest, you ha better make a simple observation nest. This is made by placing two sheets of plain window-glass, approximately $\frac{1}{4}$" apart with plaster of Paris or Turkish toewlling. The width of the gap between the two sheets of glass depends on the size of the ants. I do not advise you to put very large and robust species into such a nest. Before tipping in the nest, remove as much earth as you can, then pour the ants into one of the glass plates and quickly press the second one over it. If you are afraid of losing your ants by this method, placethe whole contraption into an arena of absolutely dry plaster of Paris, so that if the ants try to crawl away they will be foiled by the crumbling walls of plaster. When you have got the ants into the nest close it up with a piece of wet sponge inside so as to keep it moist, but not too moist or fungi will appear. Leave a small hole for putting in food. The disadvantage of this method is that you cannot breed parasites and guests, as the earth has been removed. But there is no doubt that you can observe everything the insects do I personally prefer seeing less and letting the insects feel more at home. I put gauze over the aquarium. Above all, do not keep glas in the sun; I did this once, and when I returned I had thousands of roast ants - done to a turn - on my conscience. Keep the nest well stocked with soft larvae of coleoptera, raw meat, small beetles, hon jam, cake, greenfly, and all your thrown out Death's Head Hawk larva can go in as well. They would keep the ants quiet for some time!

I would like to hear from all members who are interested in this branch of entomology to exchange ideasand species.

[illegible]

H.St.J.K.Donisthorpe - British Ants, Routledge, 1927, 436 pp.
H.St.J.K.Donisthorpe - The Guests of the British Ants, Routledge, 19

Auguste Forel - The Social World of the Ants, 2 vols, Putnam, 1928, 985 pp.

Lord Avebury - Ants, Bees & Wasps, Kegan, Paul &c., 1902, 436pp.
Dr. Julian Huxley - [illegible] Benn, 1930, [illegible]
Jean-Henri Fabre - Social Life in the Insect World, Benn, 1930
W.M.Wheeler - Ants. Columbia University Press, 1910
W.M.Wheeler Social Life among the Insects, Constable, 19

A. N. BRANGHAM.

THE EFFECT OF COLD ON THE HABITS OF ANTS

A few experiments have indicated that cold dulls the warlike activities of ants. This is particularly noticeable in their attitude towards other individuals of the same species.

A queenless colony of *Lasius* (*Acanthomyops*) *flavus* was introduced to a nest containing a single fertile female. There was no young brood present. To my great surprise the workers clustered round the queen and she was accepted. Previously in the summer I had tried to introduce a queen with no success, all being killed, although they had been isolated for some time. The colony is now living in warmer quarters, but the workers have not changed their attitude towards the queen.

Similarly with *Lasius niger*, when two workers with the brood of a dead queen were joined with a queen and one worker with no brood drom another nest. In the summer the two workers attacked any queen I placed with them. The new queen now helps to look after the brood and the three workers do likewise, showing no sign of animosity.

To test this still further, I obtained a single worker of *Formica rufa* and placed it in a colony containing two females and a few workers. The single worker, very annoyed, attacked the workers of the colony at first, but later settled down and now cannot be distinguished from the others. This conduct is certainly very unusual, as the colony and the worker were obtained from nests widely separated. This experiment could be extended by placing a worker of the same nest among the colony in summer to see what effect it might have. Experience has shown, however, that they will attack members of their own colony as well as from other nests.

Lack of material prevents me extending this research to more species, but perhaps other members would like to co-operate.

D. J. BILLES.

oOo oOo oOo oOo oOo oOo oOo

BOOK REVIEWS

"BRITISH ANTS" by H.St.J.K.Donisthorpe, Routledge, 1927, 436 pp.

Richard South's "Butterflies and Moths of the British Isles" is known as the "lepidopterist's Bible", and Mr. Donishtopre's book, "British Ants", as well as its supplement, "The Guests of British Ants", might well be called the "myrmecologist's Bible".

The book opens with a close study of the external and internal anatomy of the ant, followed by a brief outline of the insect's life history. Many pages are then devoted to a study and classification of Polymorphism, which plays an extremely large part in the life of the ant-colonies. A few introductory notes are given as to collecting, and suitable localities for ant-collecting are mentioned.

The rest of the book, which deals with the classification of every known British species and sub-species, may strike the reader at first as being somewhat formidable. The description of each species is preceded by a list of references, which are simple enough when more closely studied. Forty-odd British species are recorded, and almost every possible detail of previous and contemporary observers is give. One of the greatest difficulties in the study of ants is the classification of each species when found during collecting. Many of them are only identifiable after examination under a lens, and Mr. Donisthorpe has spared no pains in explanations and diagrams to compare the slight differences in anatomy or internal structure between the species in each subfamily and genus. There are four subfamilies represented in the British Isles, and Mr. Donisthorpe has arranged a tabular system at the beginning of each subfamily, so that one may pick out the salient differences at a glance. For example the table will inform readers that the pedicel is distinctly two-jointed in the Myrmecinae, while in the Ponerinae it is not, and thus the student of classification has his task lessened considerably at the outset.

This is undoubtedly the most valuable book on this subject that has yet been written. The last few pages are devoted to Cosmopolitan and Introduced Species, such as can frequently be found at Kew Gardens or even at Covent Garden when fruit is being unloaded, or at Liverpool or other port, where ants are brought into the country in timber.

The bibliography is the most complete one could wish for. Mr. Donisthorpe's system of classification has been universally accepted, so that the student cannot err or be biased if this book rests on his entomological book-shelf.

"THE GUESTS OF BRITISH ANTS" by H.St.J.K.Donisthorpe, Routledge, 1927, 244 pp.

This book was completed after "British Ants", but one migh say that the two books are really the same book in two volumes. The Guests are adequately described in the first volume, but Mr. Donisthorp was not satisfied with an "adequate" description, and consequently filled the second volume in greater detail. I do not think that the guests book is essential, even to a fairly advanced myrmecologist. The first book gives pride of place to the ants themselves, and the second gives pride of place to the myrmecophiles, so the process has really only been reversed and expanded. Nevertheless, Mr. Donisthorpes capacity to formulate a table which is not difficult to decipher - lik a railway-table! - is again in evidence. He bgins with the relationship between ants and their myrmecophiles (see my article in the Bulle No.12, pp. 3-5); the relationship is evidently a complex one, as Mr. Donisthorpe gives eight separate sub-headings for eight different type of relation. His estimate of the number of myrmecophilous species in the world is 5,000. After a short chapter on mimicry, the book goes on to tackle each family separately, coleoptera, lepidoptera, hymenopt and other ants who are themselves parasitic on ants, aphidae, coccidae as well as those animals who are in some way or other related to ants. These vary from slow-worms (Anguis fragilis) to Nematode Worms. Once more there is a complete bibliography and efficient index to species.

One of the most pleasant observations a collector can mak about both of Mr. Donisthorpe's books is that he does not hesitate to inform the reader of localities in which rarities are to be found. I can remember when I first began to collect and wanted to visit that ant-paradise in this country, the New Forest, I was not satisfied with the locality list Mr. Donisthorpe had given in his "British Ants". Mr. Donisthorpe had no hesitation in giving me the exact place, down to the square foot of ground where he himself had captured these treas I blush to think of the laziness of my motives then, but I still maintain that there is a great deal to be said for this method of obtainin information, providing it is willingly given. Lepidopterists do not seem to favour the idea of imparting their favourite haunts to maraudi rivals. Perhaps with ants the situation is different, but, whatever it may be, Mr. Donisthorpe gives the collector a very good idea as to where his activities might be started with profit.

"ANTS, BEES, WASPS" by Sir John Lubbock (Lord Avebury), Kegan, Paul, Trench, Truebner & Co., 1915, 436 pp.

Sir John Lubbock's book, in spite of it having been writ many years ago, is still read with great enthusiasm by those who take up myrmecology for the first time. Gould was the "Father of British Myrmecology", but Lubbock was the first to put the subject on to a scientific basis by recording exact experiments on the hymenoptera. The results of these experiments are recorded in this book. He spen many hours painting his insects and putting them to exacting tests an

His terminology and classification have now been superseded in many cases, the most noteable being Lasius, which has now been changed to Acanthomyops, as Lasius is the genus of bee.

Lubbock was the first to construct observation nests in which every movement of the colony could be observed. He conceived the idea of placing two pieces of ordinary window-glass about $\frac{3}{8}$" apart, and inducing his colony, freshly captured in the field, into this nest, and sealing the observation nest at the edges. He also recorded the length of life of an individual ant, which was discovered to be longer than previously supposed. He had a queen which lived for fourteen years, probably a record for any type of insect.

This is the sort of book one can read when relaxed in any armchair after a day's work. Lubbock seems to convey something of the thrill of adventure which is known so well to those who have had some experience of field-work in the realm of entomology.

The greater part of the book constitutes results of experiments, most of them based on experiments on the sense-organs.

Of course, later research has discovered British species of which Lubbock had no knowledge, and some of his theories regarding the evolution of the ants' social colonies and the instincts have been superseded, but the basic facts have hardly been altered at all, and the young beginner would lose very little by taking this book as his preliminary text-book, until he has made himself completely familiar with the elements of the social construction of ant-life, when he would be at liberty to graduate to such books as those by Donisthorpe, Forel, Wheeler and Janet.

A. N. BRANGHAM.

CALENDAR

May and early June.

May is the month of larvae - practically every tree, bush or weed has its devouring caterpillar at this period of the year, even more so, probably then in autumn.

The first necessity is a pair of sharp eyes with which to examine the plants by day and with the aid of a lamp at night. The second is an old and strengthened umbrella or a beating-tray. This is held beneath the bush or tree to be examined and the branches tapped several times to dislodge the larvae. As in other forms of collecting, regularly cut woods, hedgesides, edges of copses, and lone trees are the most profitable places to search or beat. A large number of imagines will usually be disturbed during the beating, so the net should always be kept handy.

An apparatus often used when collecting larvae is the following convenient receptacle;- Procure a largish tin box with removeable lid at one end. Place (by soldering) a small window of perforated zinc in one end for aeration. In the other end cut a small hole about $\frac{1}{2}$"-$\frac{3}{4}$" in diameter, and fit with a suitable cork. The whole lid may be removed for inserting food-leaves, but the caterpillars are dropped in through the corked aperture, this latter being too small for half a dozen larvae to put their heads over the side in closing the tin, with subsequent decapitation.

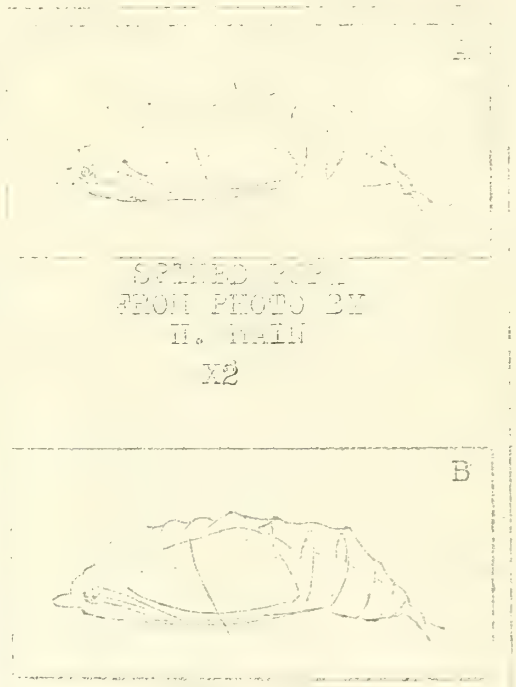
One bane of the larva collector's life at this time of the year is the cannibal. Every beginner should get to know by sight the caterpillar of the Dun Bar (Calymnia trapezina)and the Satellite (Scopelosoma satellitia). They may be placed in separate boxes with a larva or two of the Winter Moths (Cheimatobia brumata and boreata), which, if hungry, they will devour on sight. I know of no book that gives an adequate picture of these larvae. Prominent (Notodontid) larvae also occasionally have cannibalistic tendencies.

R. A. C.

Some Points on the Pupae of the Large White Butterfly.

In the Proc. Ent. Soc. Vol [illegible] p. [illegible] under the heading, "An abnormal pupa of *Pieris* [illegible] Green states that "the abnormality - which was [illegible] is in the form of a moderately slender spine taking the place of the stout conical process that normally occurs on each side of the body near the outer angle of the wing cover". An accompanying sketch illustrates the differences between this pupa and a normal pupa of the species.

I have [illegible] found in the literature I have consulted any other reference to similar spined pupae, nor have any of my numerous entomological friends that I have asked ever observed the same among British specimens. However, from a batch of young caterpillars I found in a garden in the Epping Forest district in the beginning of August [illegible] pupae were obtained. Of these, 16 which were among the first 24 produced, had very noticeable spines. These liberated 8 males and 8 females towards the end of September. The remaining 30 pupae had no spines and produced butterflies in the following spring. Attempts to obtain a pairing were unsuccessful and I was unable to get a further supply of caterpillars during the year.



SPINED PUPA
FROM PHOTO BY
H. MAIN
X2

NORMAL FORM

Pupae of Large White
(*Pieris Brassicae*)

X2

I should be glad of the assistance of as many of our members as possible, in different parts of the country, in an investigation of the subject. If they would endeavour this spring to rear from eggs or small clusters of caterpillars found on cabbages, nasturtiums &c., separate families, and send me the results of their experiments, definite information would be obtained before the end of the year. Even the newest beginners should be able to breed this common butterfly and add their quota towards a solution of the problem. Notes should be taken of where and when found; the numbers of eggs or caterpillars in each family; the number of pupae and date when produced; number with and/or without spines; the date of emergence and number of butterflies obtained in the autumn, and the number of pupae lying over the winter. Many other observations may be made at the same time, such as the number and dates of the various moults, the method of spinning up of the caterpillars and making the girdle, compared with the quite different method adopted by the Swallowtail larvae, and any obvious differences between the empty chrysalid cases of males and females.

As many of the butterflies as desired can be set for the cabinet and comparison made between those that emerge in the autumn and those that come out in the spring.

The empty chrysalis skins can be carefully removed from the cages and mounted or preserved in bulk in glass tubes or small boxes for reference.

If any member has already seen spined pupae I should be glad to receive particulars of them.

Hugh Main,   9, Woodside Road,
Woodford Wells, Essex.

QUERIES

No. 34 Have any of our members had experience of breeding *S. pavonia* (Emperor Moth)? I had a pairing last year and obtained about 150 larvae which were sleeved out on bramble, but I only obtained six cocoons. Can anyone explain the cause of the mortality?

S. G. Abell

This species is known to have marked cannibal tendencies, and, n my opinion, this was probably the cause of the disappearances.

B. A. C.

o. 35 Could any members give me information as to methods they have found effective for the prevention of mould, mites and other ecay in entomological cabinets. I have had a 30 drawer professionally-ade cabinet for many years and at various times have tried camphor nd naphthalene placed in the little cell provided in each drawer, also few spots of strong carbolic acid on wadding placed inside a minute lass phial, and still I get losses of insects from various causes. ome specimens in my collection are possibly 25 years old, and then, or some unaccountable reason, they develop mould, or possibly small hite larvae feeding internally and only traced by minute dust, or ossibly frass, under the insects. My objection to the camphor and aphthalene is that they tend to induce moisture in the drawers and so elax some insects. With regard to mould, I take it that, as most ollectors know, some insects, particularly the root and wood feeders s Ghost Moth (*H. humuli*) and Goat Moth (*C. ligniperda*) nearly always check in" in a year or so for grease and mould, and have to be replaced o keep the collection as complete as possible.

The grease-acquiring specimens I have been fairly success-ul with, by dropping a few spots of benzene(or similar liquid) on the ings and body and immediately sprinkling dry Plaster of Paris over he insect, leaving this until powdery enough to brush off lightly with very soft water-colour brush, taking care not to displace wing-scales nd body-hairs. I find this lasts several years after treatment. his same operation also removes mould, but apparently all the spores re not destroyed and in a short time a choice insect (and out of pure ussedness it usually is one) develops another "blissful halo" around ts person. As to how the small larvae appear,(of the "clothes-moth" ype) I am absolutely at a loss to understand, as the drawers are air-ight. Is it possible that the newly added specimens of the collection ave ova laid in or on them after emergence and in spite of a 24 hours mmersion in the cyanide bottle "the enemy" still come to imagines in heir due time? Of course, should I trace any signs of interior feeding t any time I promptly put a few spots of benzene (no plaster this ime) and the enemy soon leaves his domicile!!

Generally speaking, all my collecting has been done in he Midlands, but since residing in Clevedon (on the Bristol Channel dge) I have had more trouble than ever before. It is probably the ea-air, for I find that insects get relaxed much sooner on exposure the air of a room in my house, and, getting thus, soon develop mould. the affected drawers I have often noticed that by holding the glass id of the drawer to the light there are myriads of minute spots con-isting of a centre with fine filamentary, radiating hairs appearing, l, of course, on the inside surface of the glass. There are apparent- spores or hyphae of some kind and may be from the insect's mould. owever, perhaps some of my fellow members will kindly express their ews and suggestions, which I should be grateful for.

M. A. Rollason.

WANTS AND EXCHANGES

J. P. Robson (No.44) would like to exchange "duplicate" d "desiderata" lists of Lepidoptera with other members.

J. Walker (No.22) has for exchange larvae of *C. hera*

A. Smith (No.23) desired to exchange Lepidoptera and Shells, British only. He can offer foreign marine shells in exchange for British.

Wanted - to correspond with G. K. Hebbert (No.81): Any member who can bring forward evidence of colour variation due to change of food-plant; he also wishes to hear from as many as can give information on the subject of the status quo of the speckled and black forms of *Pachys betularia* (Peppered Moth) in their own district, together with any information they may have noticed relating to differences in size, habit, change in abundance and so on.

J. R. Thirlwall (No.78) expects to be going to Iceland for a holiday next July. Has any member any knowledge of the Lepidoptera of the island, or could give any information as to books on the subject.

W. J. Millard (No.80) kindly offers to make lantern slides or enlargements (on entomological topics only) at cost price for members. He also has a number of "skippers" and "blues" which some members might care to ask for. He points out that to avoid damage in transit he could meet any member by arrangement at Liverpool Street Station or in town to bring them along.

B. A. Cooper has the following duplicates of "The Entomologist" for disposal. Vols. 35-38 (1902-5); also numbers 49, 51, 85, 91, 92, 93, 96, 97, 98, 183, 230, 250, 332, 360, 522.

The Keeper of the Department of Entomology, British Museum (Natural History), Cromwell Road, London, S.W.7, states that his Department is anxious to obtain parasites bred from known lepidopterous hosts, and particularly hymenopterous parasites. Anything of this kind members care to send should be addressed to J. F. Perkins, Dept. of Entomology, etc., Since so many thousands of these are bred annually, to the great annoyance of the breeder, we feel that members should make an effort to send any that come into their hands, accompani wherever possible by full date, to the B.M. where they will be of the greatest scientific value.

The Department is also trying to build up a collection of lepidopterous larvae in spirit, and would be most grateful for any help which members might be able to give, particularly with the more local species in any stage. These should be addressed to the Keeper, N. D. Riley, personally, preferably alive, as this overcomes the difficulty of sending spirit material through the post. As a further encouragement to members, other than the thought that their gifts to the Museum would be to the benefit of science in general, the Department has larg quantities of duplicate insects of all orders, largely foreign, which, if desired, they would be glad to let members have in exchange for parasites or larvae. Postage will be refunded, if required.

MEMBERSHIP CHANGES

NEW MEMBERS

No. 70: W. J. D. Eberlie, Brooke House, Crawley Green Road, Luton,
(Lepidoptera)
No. 71: Denis Cowper, 112, North End House, London, W.14. (British and Foreign Lepidoptera)
No. 72: T. G. Shadforth; 2, Springfield Terrace, Low Fell. Co. Durha
(Lepidoptera)
No. 73: Major H. C. Gunton, M.B., F.R.E.S., Rathgar, Gerrards Cross, Bucks. (Lepidoptera)
No. 74: A. H. Lanfean, Highclere, 2, South Eastern Road, Ramsgate, Kent. (Lepidoptera)
No. 75: A. Turner, 19, [illegible] Close, Canons Park, Edgware, Middx. (Lepidoptera, General Entomology)
No. 76: S. G. Abell, 154, Thornbury Road, Isleworth, Middx.
(Lepidoptera)
No. 77: W. Roberts, 44, Hornsey Lane, Gradens, London, N.6.
(Lepidoptera)

No. 78: J. R. Thirwall, 33, Bidston Road, Oxton, Birkenhead, Cheshire
(Lepidoptera)
No. 79: J. W. Bourne, 11, Crescent Road, Sidcup, London.
(Lepidoptera)
No. 80: W. J. Millard, Sueno, Down Hull Road, Rayleigh, Essex.
(Lepidoptera)
No. 81: G. K. Hebbert, Lee Copse, Berrynarbor, North Devon.
(Lepidoptera)
No. 82: E. T. Pennock. 16, Drive Road, Linthouse, Glasgow, S.W.1.
(Lepidoptera)

PRESENT MEMBERSHIP: 77

oOo oOo oOo oOo oOo oOo

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

PRESENTED

VOL. 2 NO. 18 PRICE SIXPENCE June 1937

CONTENTS

TITLE	AUTHOR	PAGE
Editorial	Eds.	49
Dragonfly Collecting	A. F. O'Farrell	50
Beetle Collecting in Spring and Early Summer	Geo. B. Walsh	53
Calendar	B. A. C.	54
Hibernation of the Peacock Butterfly	W. E. Teschemaker	55
Hints to Beginners	S. G. Abell	55
Query No. 36	C. W. Baker	56
No. 37	Denis Cowper	56
No. 38	W. J. Millard	56
Reply to Query No. 27	T. Dannreuther	57
Announcement	B. A. C.	57
Wants & Exchanges	....	57
Membership Changes	....	58
Notes on Locust Swarms	A. N. Brangham	58
The Light-Feathered Rustic ...	A. F. O'Farrell	59

Bulletin No.19 will be published towards the beginning of July

COMMITTEE

HON. SECRETARY & EDITOR:-

B. A. COOPER,
61, Okehampton Road,
London, N.W.10.

to whom all matter for the Bulletin should be sent.

ON. ASSISTANT SECRETARY

C. H. Veale,
3, Hurst Road,
Bexley, Kent.

DEPARTMENT OF ENTOMOLOGY

HON. EDITOR

A. N. Brangham,
160, Haverstock Hill,
London, N.W.3.

Published by the Society in London.

THE ENTOMOLOGISTS' BULLETIN

is published nine times per year by the

AMATEUR ENTOMOLOGISTS' SOCIETY

The minimum annual subscription to the Society, including the year's Bulletins, is:-

Great Britain, Empire & U.S.A. ...	3/6 post free
Other Countries	5/- post free

This should be sent to the Hon. Treasurer, B. A. Cooper, at 61, Okehampton Road, London, N.W.10, Postal Orders may be made payable at Kensal Rise, N.W.10, Branch Office.

The Hon. Secretaries will be pleased to forward a specimen copy of the Society's journal and a prospectus to any non-member likely to be interested, on receipt of name and address. They will also gladly send prospectuses to those members who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage. If contributors desire return of their manuscripts after publication, would they please mention this when writing, and also enclose the required postage stamp.

The exchange colum is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting many years are advised to confine themselves to the exchange of ideas, apparatus and live insects, leaving that of set, pinned and unpinned specimens till they have had more experience. It may be added that the Editors offer no guarentee for any articles offered herein, and they are in no way to be held responsible should the privilege allowed be abused. Unless they are informed otherwise, exchange notices will be inserted in the Bulletin once only. For addresses please refer to the membership list and subsequent membership changes list.

Anyone at present not recording migrant lepidoptera and dates of first noting the species on the phenological list each year, who would care to note down and report anything connected with these subjects that he might observe, should write to B. A. Cooper or C. H. Veale for free literature and information.

If there are any members living abroad or in the provinces who are in the unfortunate position of not always being able to get the book they desire, we shall be glad to order it for them, postage being additional to the published price.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

although of interest to all amateur collectors, sets out to assist in every possible way the less advanced collector and student of entomology. Beginners are specially welcome.

ADVERTISERS' ANNOUNCEMENTS.

This page is reserved for members' advertisements (not exchanges), dealers' notices, etc., at cheap rates. For advertising rates, apply to the ADVERTISING MANAGER, Mr. A.N. BRANGHAM, 160, HAVERSTOCK HILL, BELSIZE PARK, LONDON, N.W.3, (Telephone number PRImrose 5659). Advertising 'copy' should be sent to Mr. Brangham by the 20th. of the month before the next issue of the Bulletin is published.

H.K. LEWIS & Co. Ltd.
PUBLISHERS & BOOKSELLERS.

SCIENTIFIC BOOKS

ENGLISH and FOREIGN books on the Biological Sciences can be supplied from stock, or obtained promptly to order.

CATALOGUES are issued, and will be sent post free on request.

SECONDHAND BOOKS in all branches of science are available at the Second-hand Department, 140, Gower Street. Catalogues and quotations on application.

LENDING LIBRARY

The Scientific Library lends books on the pure and applied sciences.

THE ANNUAL SUBSCRIPTION is from one guinea.

BOOKS may be retained as long, or exchanged as often as desired. New books and new editions are added as soon as published.

DETAILED PROSPECTUS will be sent post free on application

H. K. LEWIS & CO. LTD. 136 GOWER STREET,
LONDON. W.C.1.

A.N. Brangham (No. 18), 160, Haverstock Hill, London, N.W.3., has the following entomological books for sale:-

"THE STANDARD NATURAL HISTORY" edited by W.P. Pycraft, Warne, 1931, 942pp. illustrated. A standard reference book. Published Price 15/-. PRICE...10/-.

"THE GUESTS OF THE BRITISH ANTS" by H. Donisthorpe, Routledge, 1927, 244pp. illustrated. The most complete book on this subject by the leading English authority. This book is a supplement to his "British Ants". Published Price 10/6. PRICE...........4/-.

"THE SOCIAL WORLD OF THE ANTS" by Auguste Forel, Putnam, 1928, 2 vols. Vol. 1. 551 pp., Vol. 2. 445 pp. The most complete work on the social organisation and development of ant colonies, by one of the greatest entomologists. Published Price (2 vols.) £3.3.0. PRICE.......£2.0.0.

"BEES, WASPS, ANTS, AND ALLIED INSECTS OF THE BRITISH ISLES" by Edward Step, Warne, "Wayside and Woodland Series", 1932, 238 pp. An excellent reference guide to the Hymenoptera, by one of our most popular writers. This was his last work. Published Price 7/6. PRICE.......4/6.

"BRITISH BEETLES - THEIR HOMES AND HABITS" by Norman Joy, Warne, 143pp. 2[illegible] illustrations, 1933. A [illegible] book for the young collector. Published Price 5/-. PRICE.......2/6.

When ordering, please enclose 6d. for postage.

BIND YOUR BACK JOURNALS AND [illegible], stiff covered, spring-back binders, [illegible] post free. From [illegible] COOPER, [illegible] Road, London [illegible]

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

Vol.2 No.28 June 1937

HON OFFICERS:-
[illegible]
[illegible]

Dear Fellow Members,

While we whole-heartedly condemn the rather secretive attitude taken up by some collectors on the mention to beginners of good districts for collecting, it remains a fact that many species have been made more scarce, or even exterminated, in numbers of their original haunts through over-collecting in the past. Whether this was due to dealers and greediness on the part of so-called entomologist or merely through thoughtlessness and accident, aided by natural cause it is difficult to say, but the fact remains that great care must be exercised in spreading knowledge of the whereabouts of these local species. Many of these insects are common enough in their especial haunts, but this fact should not warrant the taking of large quantitie of specimens. Some species rapidly die out when their abundance has fallen below a certain level, and it is in such cases that the collector is apt to search with more than usual care, lest he should overlook a specimen, thus preventing any return to former numbers. We have known of collectors making pilgrimages to small localities for a short stay, there concentrating all their time and energy on boxing every single specimen of the rarity which may offer the opportunity of capture. Of course, the numbers of many species are apt to undergo a regular cycle of changes, and it is when the minimum is reached that any damage done is greatest; however, generally speaking, one usually finds that species which fluctuate regularly are not so liabl to extermination as those which undergo a gradual and progressive diminution.

A code of honour seems to have sprung up amongst entomologists, in consequence of this, whereby all mention of localities shal be taboo, save in a very generalised and often misleading way. It i thus, for fear of bringing the Society into disrepute, that we feel compelled to refrain from mentioning definite localities, at least of the more local species. As in all things, in guarding against the rogue, the innocent must also suffer, but that, unfortunately, we cannot help. Probably all our members will agree that it is preferable to see a species alive in its native surroundings, than to know that a specimen would fetch a high price at a sale, or to be abl to point proudly to a set specimen in a cabinet, and say, "That is th last of its kind in this country!"

Another point of view of less importance (a few might pla it on an equal footing) is that each one of us has his collecting ground which he more or less considers his own property. It is therefore hardly fair to him for example for another to visit the same spot and rob him (for that is what it comes to) of some of his specimens.

It is only by experience and by forming friendships with other enthusiasts that a number of species will be obtained. There are numerous relatively common species that the collector will not meet with during his first ten years of collecting. This may sound a great span of time, but we feel it safe to say that no-one can bu a perfect collection in this time, solely on his own catches.

This need not, however, bar the amateur from obtaining specimens, or breeding most of our British species of lepidoptera coleoptera and most other orders as well. The purpose of our column is to facilitate this, and we hope members will avail themselves of its services, whether for rare or for common species, and in all stages of their metamorphoses.

Last, but by no means least, it has come to the notice of the Editors that one of the members of the Society, Dr. Otto Koenigsberger, has left his Davos address, and has gone to St. Gallen, Switzerland, in order to undergo a serious operation. This was performed in May, and the latest news which has come through to us is that he is recovering slowly, and that the operation has been successful, although leaving him weak for some time to come. In the name of the whole Society we wish Dr. Koenigsberger the speediest of recoveries.

Yours sincerely,

B. A. Cooper
A. N. Brangham.

oOo oOo oOo oOo oOo oOo oOo

DRAGONFLY COLLECTING

Anyone who has ever been near a pond or stream in summer must have been struck by the beauty of the dragonflies frequenting it, but unfortunately ignorance and prejudice on the part of country folk have given the dragonfly a wholly undeserved reputation as a noxious stinging insect, which has even led to one or two lepidopterists of my acquaintance being afraid to touch a captured dragonfly. It may be due to this unfortunate ignorance that one meets so few amateur entomologists who have any knowledge of the order.

Yet the Dragonflies, or Odonatæ, besides including some of the most beautiful insects known, both in tropical and temperate zones, are an extremely ancient and interesting order, having scarcely any relationship with any other modern order except the equally ancient Mayflies, or Ephemeroptera. Among the earliest known insect fossils are the enormous Meganeurids, over two feet in wing span, found in the coal measures at Commentry in France, in a sufficiently well preserved condition to enable reconstructions of them to be attempted. These have shown clearly that our modern dragonflies are but little different in essentials from those huge Carboniferous insects. Other orders have changed immensely since those times, but the dragonflies are almost unaltered.

There are nearly fifty British species of Odonata, if one includes records of isolated specimens. Forty-two species can certainly be regarded as British, and of these the beginner should, with luck, meet over half during his first season's collecting. Of the remainder, many are extremely rare or local so far as is known, but more extensive collecting may reveal new localities for them. Forty years ago, _Somatochlora metallica_ was regarded as a great prize, found only round certain lonely lochs in Scotland. Now it is locally plentiful in many places in South-east England within a few miles of London. Presumably it was present in these latter places all the time, being overlooked by the few Odonatists who visited them owing to its (very) superficial resemblance on the wing to the common species, _Cordulia aenea_. The same may well happen with some species now regarded as rarities, if more collecting is done. What follows is a guide to the collecting methods most likely to be successful; in the space of this article it is useless to try to give even a superficial guide to identification. Step's "British Insect Life" gives a certain amount of information on the subject. Lucas's "British Dragonflies" is expensive, but is a useful guide if obtainable. Anyone wishing to make a serious study of the order should get Tillyard's "Biology of Dragonflies", which, though dealing largely with Australian types, contains a most useful guide to the British species, though the information on distribution is a trifle inaccurate.

The smaller, less powerful dragonflies, comprising the sub-order Zygoptera, are easily collected by anyone armed with a butterfly net and the knowledge of how to use it. They are for the most part lovers of ponds, dykes and canals, along the banks and over the surface of which they fly in the sun with a weak flight, resting at frequent intervals on reeds and other vegetation. At rest, owing to their small size and slender build, they are quite hard to see.

I once looked at a bright crimson Pyrrhosoma tenellum sitting on a rush for three minutes before I saw it. The best collecting ground for these little dragonflies is along a reedy ditch containing clean slow-flowing water. In such a place they are always within reach, instead of fluttering tantalisingly over the water as they are apt to do on ponds. One such ditch I know will yield nearly all the Britis Zygopterids, apart from rarities, in the course of an afternoon in, say July. Two of the most beautiful species must, however, be sough near running streams, though occasionally occurring casually on ponds and canals. These are the Calopteryx species, C. virgo and C. splendens, popularly called "demoiselle-flies".

The larger, more formidable-looking members of the subord Anisoptera are not on the whole so easily caught. Their more powerful flight renders many species prone to wander away from the neighbourhood of water, or else to fly so high and fast far out over the surface of some large pond where they could only be captured, one feels, by seaplane. Patience, however, is often regarded by enablin one to get a stroke at the insect when it returns to terra firma to devour at leisure some unhappy fly it has captured. On such occasio one should keep as still and quiet as possible while waiting for the dragonfly to approach and make no movement with the net until one is sure of its being within range; many a fine dragonfly will be lost unless this precaution is observed, since many species will not retur for hours after having been given a fright of this kind. It is always worth while to watch the dragonfly for a time before attemptin its capture, since many large, high-flying species have two habits which enable them to be captured. Firstly, they tend to hawk up and down over a particular area, returning on the same course time after time. Secondly, they often have a favourite bush or even branch to which they always return for the purpose of devouring thei prey, unless disturbed. Of course, a few species, notably Sympetru and Libellulas can readily be captured without all this bother, but most Aeschnidae are difficult to get unless one is willing to use a little patience.

Captured dragonflies should on no account be put in boxes except the smallest Zygoptera, which are far too weak to damage themselves greatly. Even with these, however, by far the best plan is to fold the insect's wings over its back and paper it alive in a fol paper triangle of suitable size, or even an ordinary paper envelope will do. Each dragonfly should be papered separately and the papers put in a conveniently sized tin, taking care to avoid crushing them. It should be made a rule never to box or kill a captured dragonfly in the field, as otherwise the always tiresome task of colour preservation for cabinet specimens is likely to become impossible. This difficulty of colour preservation varies in different groups; the Libellulini, Calopterygidae and Lestidae all keep their colours fair well, especially if left papered for a day or two before killing, to ensure complete removal of the contents of the alimentary canal. T Agrionidae are more difficult to deal with, but their blues and gree sometimes keep fairly well if they are starved for a few days before killing; the reds of the Pyrrhosomas keep very well as a rule, and t same applies, among the Anisoptera, to the Corduliinae. More diffic is experienced with the reds of the Sympetrini. Tillyard advocates the use of a drying oven, in which the specimens are dried on the setting-boards at a temperature not exceeding 105° F, but I have not tried this method. Some red species of a similar type sent me from India, however, seem to prove that rapid drying, in this case by the Indian sun, is very effective in preserving these reds in their full beauty. The family with which real trouble is experienced is the Aeschnidae. The blues and greens in this family are due to pigmentation of layers so deep that decomposition of the fatty material in t body invariably destroys the pigment. This does not apply to the same extent in the genera Gomphus and Cordulegaster, in which the yellow pigment appears more resistant to this form of destruction. But even in these species, and certainly in all other Aeschnids, it is advisable to open the abdomen carefully along the ventral surface-without damaging the external genitalia, and remove as much as possible of the contents with fine forceps. The empty abdomen may then be loosely stuffed with a suitably shaped piece of cotton wool soaked in 70% alcohol, and the insect set as usual. This rather laborious method is the only one with which I have had any success; even so the effects obtained are very poor in proportion to the labour and sometimes the colour is preserved only in patches. It seems to me better to rely on a specimen preserved in spirit to show as much colour as possible. In any case there is no method of preserving the exquisite eye colour so often found in these dragonflies. In all cases cyanide may be used for killing, but the insects should not be left in it longer than necessary.

Another difficulty likely to beset the beginner is the occurrence of the teneral stage in dragonflies, which, unlike Lepidoptera do not attain their mature state as soon as they have finished drying their wings. The hardening of the cuticle and the development of the pigment requires prolonged exposure to the air to complete it. Soft, dull-looking specimens, in which the male often approximates to the colour of the mature female, are often encountered for this reason, and are said to be "teneral". The teneral state may last for days or even weeks, and during this time, in the larger species, there is a tendency to wander very far from water. Teneral specimens should never be taken if others are available, since they shrivel on drying and make a wretched show in the cabinet.

An article on dragonfly collecting would not be complete without some reference to breeding. All dragonflies have an incomplete metamorphosis, no resting pupal stage being found. The nymphs, as the early stages are usually called, are always aquatic and predaceous in habit. Those of the larger species are ravenous feeders when nearly full grown, attacking tadpoles, small fish, etc. The nymphs are mostly sluggish in habit, though some of them can swim very fast at times. They are therefore most readily obtained by dredging up masses of weeds, mud and general debris in a stout net from a suitable pond, canal or stream. The use of a hook and weighted line for dragging up masses of material from the deeper water is also a successful method at times. The material must be examined very carefully, as the nymphs are rather like sodden twigs in appearance, and the larger species in particular are much addicted to shamming dead, when they are very hard to spot. The nymphs are as a rule most plentiful, from the collector's point of view, in late winter and early spring, especially, for some reason, if there is a thin film of ice on the water.

Having been sorted out, the nymphs may be taken home in tins loosely packed with damp water-weed. These are better than any sort of jar or tube of water, in which the nymphs only get shaken up. A supply of 2 lb. jampots is the next essential on reaching home. A single large tank for keeping the nymphs in is useless, owing to their marked cannibalistic tendencies. Large Anisopterid nymphs should be given a jampot apiece. Smaller ones may be put two or three in a pot, if they are well fed and are all about the same size. Very small Anisopterid nymphs may be kept ten in a pot if well fed. In all cases the water must be kept clean and well aerated, especially for small nymphs and running water species. A little weed and mud should be provided for the nymphs to hide in, and shortly before the expected emergence of the imago a roughened twig should be put into the pot, so that the nymph will be able to cawl up out of the water and get a firm foothold on the twig before undergoing metamorphosis. Feeding of the nymphs is fairly easy. Small earthworms, varied by tadpoles and fresh-water shrimps when possible, form a diet for most well grown Anisopterid nymphs. Smaller Anisopterid nymphs will take small fresh-water shrimps, Mayfly larvae, gnat larvae, etc. A similar diet is satisfactory for the largest Zygopterid nymphs, which, however, are not such ravenous feeders. Smaller Zygopterids, like very young Anisopterids, do best on small blood-worms and other minute dipterous larvae, usually to be found in plenty in the weeds and mud in which extremely rapid movements, and rounded carapace make them very elusiv

Breeding dragonflies from the egg is not easy, though ver interesting. Anyone interested in this or any other problem concern-ing dragonflies is invited to write to me on the subject, when I wil do my best to reply.

A. F. O'Farrell.

oOo oOo oOo oOo oOo

Beetle-collecting in the spring and early summer

At this season the coleopterist, like the lepidopterist, finds every minute of his spare time occupied in collecting, setting and mounting insects, and naming has to be put off until the winter. Every part of the countryside is alive with beetles, and it is impossible in one season to collect in all the possible habitats. Even th beginner - and much more the experienced collector - will find it bes to search for some special insect, preferably a rare or local one, and while he is doing this the commoner ones can be taken as they tur up; in this way the collection will be built up at a much quicker rat than by merely haphazard work.

The swep-net and beating-tray will be in frequent use, and the beginner will find a plethora of specimens to occupy his ti at home. Even here, specialised work will give the best results; for example, aspens should be beaten for Dorytomus longimanus, the male flowers of pine for Rhinomacer attelaboides, thistle for Cleonu piger and Cassida rubiginosa, and so on. Even with things of more widely-varied food-plants, such as the Meligethes, definite search w often give better results than general sweeping; M. planiusculus oc on Viper's Bugloss, and I find M. viduatus by searching flowers of Geranium sanguineum in early July.

As with larvae, beetles often occur in enormous numbers on vegetation in the evening, and sweeping then is often very successful. The catch is best emptied into a large bag which can be well-closed at the neck, and then examined at home.

Flowers of hawthorn, mountain ash and guelder rose shoul be beaten into the tray; the best results are obtained when flowerin shrubs are not numerous, as then the beetle fauna is more highly "concentrated".

One of my favourite methods of collecting is by sifting cut grassin hayfields. It is best to wait until the upper layer o the swathes is dry but the lower layers still damp. The whole swat is then picked up, especial care being taken to get the lowest lay thrown into a sheet and worked through the hands, the sifted mater being thrown on one side. If special plants happen to be in the grass, one can get beetles that feed on them; I once found Chrysom orichalcea var. hobsoni in Teesdale in cut grass containing hemlock.

River banks often yield very rich hauls, especially in the north. If they are shingly the stones can be turned over, but a very satisfactory method of collecting is to splash the sides, ev when vertical, with water from the stream. Just sufficient to mak it well wet is all that is needed; if the sides are drowned with water the beetles seem stay hidden. Profitable results can be obt ed by stamping on the sand or clay, when beetles will come out of th cracks; this works well when there are large patches of drying mud with big cracks in a river estuary. These are good methods of gett species of Bembidium and Bledius.

In an average season clay sea-cliffs are productive, especially if they are just washed by the tides at the highest spri I have taken Nebria livida by working the foot of the cliffs with lantern at night, but a better method is to pull off the clay in places where it is fairly damp. Finds include Bembidion stephensi B. nitidulum, Chlaenius vestitus; and in the sandy clay we can fin burrows of other species of Bledius.

Rubbish on the shore will yield its share of beetle li adapted to such a habitat. Rotten seaweed, decomposing sea-birds, porpoises and the like should all be examined. It is wise to see the hands are free from cuts (to avoid risk of blood poisoning) and it is decidedly pleasanter to work on the windward side.

On a windy day with the wind blowing from the land, one can search at the foot of cliffs, or sand-dunes on the lee side, and in inland sand-pits with steep sides; here one can find beetles which are attempting to climb back to safety.

The last method to be mentioned now is the use of carrion traps. A two-pound jam-jar will serve. The bottom is covered with a little soil or moss, and then a small piece of flesh ("lights" is very good) or fish (skate or herring are even better) is put in. This is buried up to its neck in the soil in some place where it is likely to be untouched, and it is covered with stone, bark, etc, to keep out the water, a piece of wood being used to lift the top and litter. It should be examined at frequent intervals. Beetles obtained in this way are usually very dirty, and are best killed with boiling water, dried, rel[illegible] tube, and then well washed before being set. This method will work even in mild weather in the depth of winter.

Geo. B. Walsh.

oOo oOo oOo oOo oOo

CALENDAR

June and early July:-

Lepidoptera:- The season is now at its height and to enumerate all the modes of collecting of value at this time of the year would require a book to itself.

Larva-hunting by day and night continues, and searching and beating [illegible] eagerly followed [illegible] lamp-posts [illegible] should be regularly searched if the neighbourhood is not too urban; even so, it is surprising what species often turn up or are native in towns. By day, trees, hedges, nettle-patches and long grass are the hiding places of many a specimen waiting to be flushed and netted by the eager collector, especially as dusk grows near. After dark, blossoming patches and hedgesides should be carefully examined, while both "suger" and "light" will be found of great value.

A few words on light may not be wasted here. The question on the best kind of light for the purpose has yet to be answered (see query [illegible]). The fact remains that different types of lamp produce different results in attracting moths. Of the more easily obtained lamps, the Tilley Lantern (paraffin) and the Primus (petrol) are very useful. The lamp is generally placed on the ground resting on a spread-out sheet, a second sheet often being suspended behind it vertically to face down a glade, clearing or field. The collector then stands by or rests [illegible] on the sheet, net in hand, awaiting the arrival of the prey. The unwanted specimens are released later or at a distance, otherwise they soon return and become a nuisance. Times of most profitable activity are variable, from immediate dusk almost till dawn sometimes being of equal attractiveness. General opinion has it that 11 p.m. till 2 a.m. are usually the periods of maximum activity, but the weather prevalent at the time is the major deciding factor. If car headlights are used it is as well to place over the front of the car a sheet with holes cut to fit the lamps. This does away to a great extent with the annoyance due to the best insects vanishing under the engine bonnet or mudguards; the suspended sheet is here best placed up to a hundred yards or so away, giving room for chasing up and down between.

Another method of working light is to place a bright light in a room with open windows and to await the sound of bumpings on wall or ceiling. Street lamps may on occasion be climbed for a specimen (provided no policeman is in the offing) while the weighty prefer to use a long-sticked net for the purpose. Light traps, too, may be obtained from dealers or made oneself, and left on all night in country placed commanding a fair open stretch of country (see Journals Nos.3 &8)

However, as most of our members are unable, except at rare intervals, to do any of this late night work, this will be a suitabl place to finish - before they have seriously considered giving up collecting in disgust.

B. A. C.

oOo oOo oOo oOo oOo oOo

HIBERNATION OF THE PEACOCK BUTTERFLY

On the 1st September 1936 a neighbour sent me a V. io (Peacock butterfly) which he had found in his house. A couple of days later I found two in a comatose state in my own house; thinkin that they had flown in by accident I turned them out. When, howev I found another fast asleep on the wall of a bedroom, I at last rea ed that all these specimens were hibernators. Normally, this spec is flying here (Devonshire) throughout the whole of August, but thi has been a remarkable summer (!)

This io remained motionless for several days, but we th had a really hot day, which aroused it, and I saw it fly out of the window. The same afternoon I saw 3 io's (probably the same 3) sunning themselves in my garden, but I never saw them again.

One of our members sent me a dozen larvae of this speci from Cheshire, but they did not emerge from the pupal state until t 24th August, showing how much later the North of England is than th South. I placed the case containing them in a (moderately) warm conservatory to see how long they would live. I gave them honey diluted with water in a small glass phial, but this mixture soon became encrusted on the top, so I tried Golden Syrup diluted, and this seemed to answer well.

On sunny days they would fly about in the cage, and the beautiful colouring showed up especially well when they alighted on the layer of oak leaves which covered the floor of the cage. Alas most of them were dead in a month's time, and none survived longer than 6 weeks.

Is it possible to keep any species of butterfly through the winter? I have never succeeded, nor anyone else that I know personally.

Apparently the gorgeous colouring of this species is th most evanescent of any. Not long since I came across a wall-case containing a very large number of specimens of most of our English species, which had evidently been exposed to strong light for many years. The Peacocks had faded more than any, and the only species which had retained its original colour was the Orange-tip!

26th March 1937. A fine Peacock was found this morning in a clos room in my house, where it had evidently hibernated. It was quite lively, and on being turned out flew away strongly. Compare this result with the fate of my captive specimens. I sent some notes o artificial hibernation recently to our Bulletin, which seem to me t explain the matter partly.

W. E. Teschemaker.

oOo oOo oOo oOo oOo oOo

HINTS TO BEGINNERS

Since our aim to encourage the behinner has, owing to lack of time on the Editors' part, been rather sadly neglected in past, Mr. S.G.Abell has kindly offered to do his bit towards keepi this section going. Any with useful snippets of advice, warning suggestikn for study are asked to send along contributions for the section. When enough matter has been received we shall probably reprint in booklet form as an aid to those in future wishing to ta up the hobby. That, however, may be some time yet to come. Our first instalment deals with the making of a handy breeding cage.

A Home Made Breeding Cage

A cheap and useful breeding cage can easily be made in the following way. It consists of 3 parts:-

1. A wooden tray
2. A wooden framework covered with perforated zinc on 3

and glass on the other, with wood-pegs to fit in the tray.
3. A lid to fit the top of the framework.

Obtain two wooden boxes - the exact size is immaterial. I use "two bottle" White Horse cases measuring 12½"x 7½" x 3½". Take one of the boxes to pieces, saw the 4 sides in half and reduce the height of the other box to 2½". Four pieces of wood 1" x 1" about 12" long are required for the four corner posts of the framework. A piece of perforated zinc cut the exact inside length of the box and about 9½" wide, and two pieces the exact width of the box by 9½" are also required.

Assemble the frame in the following way:— Lay two of the corner posts on the bench parallel, and on these at a distance apart equal to the inside length of the box lay the large piece of zinc with its top edge about a quarter of an inch from the top of the posts; then lay one of the half side strips (12½"x 1¾") across the two uprights coinciding with their top edges, and cover the zinc, fastening in position with nails. Lay the second half strip (12½" x 1¾") across 2½" from the lower ends of the posts, covering the zinc, and nail in position, thus completing one side of the frame. The other two uprights are joined with the two half strips (12½" x 3½"), but without the zinc, the two inside edges of these being chamfered to allow a piece of glass to be slipped in; the glass may be left loose, sliding in and out as required. These two sides are now joined together by the 4 short half side pieces (7½" x 1¾"), securing the two smaller pieces of zinc for the end panels; the edges of the zinc, where left bare, should be tacked down with wooden strips.

When completed the framework should resemble a box without top or bottom, three sides covered with zinc, one with glass, and with the four corner posts protruding about 2½" for securing the framework to the bottom tray.

All that now remains to be done is to make some kind of a top covering; this may be zinc in a wooden frame, a piece of glass, or even the lid of one of the boxes; the zinc is to be preferred. The total cost of the cage I made was:-

Rough wood including boxes	4d.
Zinc	6d.
Nails	1d.
Glass	6d.
Total cost	1s. 5d.

I have tried to make these instructions as simple and clear as possible, but should any member have difficulty I shall be pleased to forward a photograph or any other particulars.

S. G. Abell

oOo oOo oOo oOo oOo

QUERIES

No. 36 C. W. Baker complains of difficulty in obtaining continental species for breeding purposes. He instances Aptura iris (Purple Emperor) as a species very common abroad, but rare in Britain, which should be commonly reared by all collectors. Other species not found here are easy and interesting to rear, but the difficulty is in obtaining them. Perhaps members may be able to give advice on dealing abroad, as well as the addresses of persons or firms dealing in live stock.

No. 37 While collecting in Sussex during the latter part of April of this year, I took amongst a large number of females of the normal Spring brood of Celastrina argiolus (Holly Blue) a female similar to the summer form which was exceptionally marbled. Is it likely that this was a delayed specimen, or was chance variation or change of food-plant the most probable cause?

Denis Cowper (71)

No. 38 What is the best way to relax papered exotics about twenty years old?

W. J. Millard (80)

REPLIES TO QUERIES

No. 27 The following information may be added to my reply in [illegible] Bulletin No.16 for winter flowers attractive to butterflies. In 1933 swarms of Vanessa atalanta were recorded on Bell Heather late in the summer in Scotland when the wild Heaths are in bloom (Erica cinerea, E. tetralix, E. vagans) but this spring, 1937, I have been much surprised to hear of a stationary colony of Vanessa cardui of both sexes reported by Mr. J.E.Flynn (Entom. 70:92) in the garden by the sea at Roche's Hotel, Glengarriff, S. Ireland, appearing on Erica on warm sunny days between February 24th and April 23rd, joined [illegible] 21st by butterflies out of hibernation (Aglais urticae and Nymphalis io) and a solitary worn Vanessa atalanta. They all fed on Erica, and basked in the sun until the Dandelion flowered in April, when some went to the latter. As the wild Erica flower in summer I obtained the particular cultivated varieties that this unusually early assembly of butterflies was attracted to. They were as follows:- Flowering December to April: Erica carnea and E. codonodes = E. lusitanica Flowering March to May: Erica Veitchiana, E. australis and E. mediterranea. On April 3rd as many as ten V. cardui were seen together on Erica and a few have been recorded in other places in Co.Cork, but the only English records this winter were one V. cardui at Lyme Regis Feb. 20th (W.J.Harding); two flying north at St. Mary's, Scillies March 26th (R.Trotter); three flying north at Brighton on April 3rd and one flying N.N.E. at Ewell on April 9th (A.A.W.Buckstone). There have only been eight records of V. atalanta and none of Plusia gamma in England this winter.

T. Dannreuther.

ANNOUNCEMENT

We have received a subscription from one of our members abroad. We should be glad to hear from him to know to whom to post the receipt.

B. A. C.
Hon.Treasurer.

oOo oOo oOo oOo oOo oOo

WANTS & EXCHANGES

J.P.Robson (No.44) would like to exchange "duplicate" and "desiderate" lists of Lepidoptera.

W.O.Steel (No.86) wishes to exchange Coleoptera, especially Staphylinidae and Australian species.

D.H.Sterling (No.84) has as duplicates pupae of D.tiliae (Lime Hawk), A.populi (Poplar Hawk), D.vinula (Puss Moth), larvae of P.similis (Yellow Tail) and O.potatoria (Drinker). Wanted - Larv Tigers except A. caia (Garden), Northern species, L. quercus (Oak Eggar) and others.

(Transferred from A.F.O'Farrell):- L.H.Ennis (No.61) urgently needs Japanese and other palaearctic species of the genus Taeniocampa (Monima). Living pupae preferred, but set or unset specimens accepted. Of British species only Scottish and Northern forms wanted. Most of the common British Lepidoptera, Coleoptera and a few Odonata (Dragonflies) offered in exchange.

H.E.Chipperfield (No.64) has living larvae of Phigalia pedaria (Pale Brindled Beauty) for exchange. Wanted - other larvae, especially Eriogaster lanestris (Small Eggar).

Major [illegible] (No. [illegible]) requires numbers of Plusia gamma (Silver Y) for [illegible]. He prefers the specimens alive (condition is immaterial), but if killed he would like a slip enclosed naming the killing agent used, i.e. whether ammonia, cyanide, ether, carbon tetrachloride, etc., as the treatment required for staining for microscopic examination has to be varied accordingly. Address:- Booth Museum, Brighton, Sussex. Postage will be refunded.

The Keeper of the Department of Entomology, British (Natural History), Cromwell Road, London.S.W.7, states that his [illegible] bred them [illegible] [illegible] [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

No. [illegible] [illegible] ackiston, R.F.A.(rct.), B.A.(Oxon.), F.R.E.S.,
[illegible], 12, Old Shoreham Road, Hove, Sussex.
([illegible] S.S. Recorder for West Sussex)
No. 84. L. H. Sterling, 91, Calbourne Road, London, S.W.12.
(Lepidoptera)
No. 85. A. Horder, 54, Belle Vue Road, Salisbury, Wilts.
(Lepidoptera)
No. 86. W. O. Steel, 16, Upsdell Avenue, London, N.13.
(Coleoptera)
No. 87. J. W. Hughesdon, The Anchorage, Aldenham Road, Bushey, Herts.
(Lepidoptera)
No. 88. Dennis E. Ballinger, Entomologist, The Cottage, Canham Road,
London, W.3. (Lepidoptera)
No. 89. Lieut. C.W.Baker, R.N., 32, Amberley Road, North End,
Portsmouth, Hants. (Lepidoptera)
No. 90. H. C. Morgan, 26, Campbell Road, Salisbury, Wilts.
(Lepidoptera, Hymenoptera, Gen.Entomology)
No. 91. R. C. Dyson, 108, Stanford Avenue, Brighton, 6, Sussex.
(Lepidoptera).

Names removed because of [illegible] of subscription:- Nos.14,16,17, and 25.

PRESENT MEMBERSHIP: 82

oOo oOo oOo oOo oOo oOo

NOTES [illegible]

[illegible] Egypt is about to be invaded by [illegible] quantities round [illegible] threatening [illegible] [illegible] even [illegible] [illegible] [illegible] in [illegible] and burned. [illegible] reckoned [illegible] preventive measures, [illegible] on-coming swarm. [illegible] destroyed by various means. Millions of pounds worth of [illegible] It

... probable that the locust in question was the common ...
Near East (Locusta migratoria), but it may have been the Desert Locust
(Schistocerca gregaria).

A rather interesting and puzzling point about L.migratoria is that, although it is know that individuals do not altogether desert a district once a plague of them has infested it, yet the young (danica) have often totally different characteristics from the previous generation. The adults (migratoria) have a uniform colour, while the danica vary exceedingly, and the relative sizes of the wing-cases and the femora and parts of the thorax differ too. Research has shown that even internally there are differences, in that the air sacs are of variable size. It used to be thought that owing to this great discrepancy between the migratoria and the danica, that the latter was really a separate species. The intermingling of these two species was therefore explained that one species (migratoria) was the active invading pest, while the other (danica) was the local sedentary grasshopper. It was only after long and laborious experiements that it was discovered that the two types were one and the same species.

Locusts swarm because of overcrowding. It seems as if th are unable to swarm without the overcrowding. Now, if swarming is an inherent instinct of this particular insect, we can well imagine that if there is no overcrowding they will breed sufficiently until there is a definite excuse to say that there *is* overcrowding, and the swarm will set off. Swarms such as those which periodically hit Egypt are more often than not composed of two or even three generations, owing to the inevitability of species propogation under such circumstances. It is only these big swarms which migrate to any great distance.

The instinct to swarm seems to be inherent in all the species of the family Acridiidae (Locusts and Short-Horned Grassho for even in this country it is possible to find a large number of Grasshoppers banding together in the early stages of their life. The potentiality, therefore, exists, even if only feebly in comparis with the fearful Locusta, and the instinct is stimulated by any semblance of overcrowding in the district.

A. N. Brangham.

oOo oOo oOo oOo oOo

D. H. Sterling (No.84) has as duplicates A. populi (Poplar Hawk) and D. tiliae (Lime Hawk) as ova and set specimens. Also larvae of P. similis (Yellow-tail) and O. potatoria (Drinker moth). Wanted - larvae of L. quercus and var. callunae (Oak and Northern Eggar); pupa of fimbria (Broad-bordered Yellow Underwing); all Tigers except A. ca and C. dominula and many others. This note cancels that appearing earlier in the Bulletin.

oOo oOo oOo oOo oOo

THE LIGHT-FEATHERED RUSTIC

Last year I collected a number of larvae of the Bee Hawk-Moth (Hemaris fuciformis) from honey suckle in Surrey. Having no honeysuckle in my garden I also collected a large supply of the food-plant. Later on I noticed a small noctuid larva in the cage, but took little notice of it, thinking it was probably a young areola (Early Grey) larva. The fuciformis larvae in due course pupated and were left in the moss at the bottom of the cage. On May 2nd I was very surprised to find a nice female Agrotis cinerea (Light-Feathered Rustic) sitting newly emerged in the cage, and on May 5th I bred a male of the same species. In South's "British Moths" wild thyme is given as the food plant of cinerea, with dock as an alternat But evidently my cinerea must have been introduced into the cage as very small larvae (or even eggs) on the mass of honeysuckle I had Have any other readers noted this species feeding on honeysuckle ally. There has never at any time been any wild thyme in the cage, nor dock from a locality where cinerea is likely to occur.

A. F. O'Farrell.

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

WITH THE EDITORS'
COMPLIMENTS

BRITISH MUSEUM (NAT. HIST.)
DEPARTMENT
ENTOMOLOGY

VOL. 2 NO. 19 PRICE SIXPENCE July 1937

CONTENTS

TITLE	AUTHOR	PAGE
Editorial	Eds.	62
The Fruhstorfer Butterfly Collection at S. Kensington	A.N.B.	62
Phenological Records 1936	Major H. C. Gunton	63
Calendar	B.A.C.	69
Transplantation of Species	B.A.C. and E.T.Daniels	70
Hints for Beginners	S.G.Abell	71
Mutations and Racial Changes due to Differences in the Environment	G.K.Hobbert	72
Definitions	B.A.C.	74
Apology	EDS	75
A Few Reminders	B.A.C.	75
Marked Butterflies	T.Bainbrigge Fletcher	76
Notes	Eds.	76
Recieved	B.A.C.	77
Replies to Queries: No. 26	Captain T. Dannreuther	77
No. 34	Major H.Blackiston	77
No. 35	Major H.Blackiston	77
Queries: No. 39	B.A.C.	78
No. 40	A.N.B.	78
No. 41	A.N.B.	78
Wants & Exchanges		78
Membership Changes		78

There will be no Bulletin in August, the next, No.20, being published in early September. All contributions must be recieved by August 10th, exchange notes by the 24th. Members are specially asked to endeavour to reply to unanswered or only partially answered Queries from back Journals so that these may be included in the reprint.

COMMITTEE

HON. SECRETARY & EDITOR:
(To whom all matter for the Bulletin should be sent).
B.A.COOPER,
61, Okehampton Road,
London, N.W.10

HON. ASSISTANT SECRETARY (To whom to apply if further Bulletins required):
C.H.VEALE,
8, Hurst Road.
Bexley, Kent

HON. EDITOR & ADVERTISING SECRETARY:
A.N.BRANGHAM,
1c, Howitt Road,
London, N.W.3

Published by the Society in London

THE ENTOMOLOGISTS' BULLETIN

is published nine times per year by the

AMATEUR ENTOMOLOGISTS' SOCIETY

The minimum annual subscription to the Society, including the year's Bulletins, is:-

Great Britain, Empire & U.S.A.	...	3/6 post free
Other Countries	...	5/- post free

This should be sent to the Hon. Treasurer, B. A. Cooper, at 61, Okehampton Road, London, N.W.10. Postal Orders may be made payable at Kensal Rise, N.W.10, Branch Office.

The Hon. Secretaries will be pleased to forward a specimen copy of the Society's journal and a prospectus to any non-member likely to be interested, on receipt of name and address. They will also gladly send prospectuses to those members who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage. If contributors desire return of their manuscripts after publication, would they please mention this when writing, and also enclose the required postage stamp.

The exchange colum is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting many years are advised to confine themselves to the exchange of ideas, apparatus and live insects, leaving that of set, pinned and unpinned specimens till they have had more experience. It may be added that the Editors offer no guarantee for any articles offered herein, and they are in no way to be held responsible should the privilege allowed be abused. Unless they are informed otherwise, exchange notices will be inserted in the Bulletin once only. For addresses please refer to the membership list and subsequent membership changes list.

Anyone at present not recording migrant lepidoptera and dates of first noting the species on the phenological list each year, who would care to note down and report anything connected with these subjects that he might observe, should write to B. A. Cooper or C. H. Veale for free literature and information.

If there are any members living abroad or in the provinces who are in the unfortunate position of not always being able to get the book they desire, we shall be glad to order it for them, postage being additional to the published price.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

although of interest to all amateur collectors, sets out to assist in every possible way the less advanced collector and student of entomology. Beginners are especially welcome.

[illegible]

[illegible] reserved for [illegible] advertisements (not exceeding [illegible] words) [illegible] at cheap rates. For advertising rates, apply to the ADVERTISING MANAGER, Mr. A.N. BRANGHAM, 160, HAVERSTOCK HILL, [illegible], LONDON, N.W.3. (Telephone [illegible] PRImrose 1656). Advertising 'copy' should be sent to Mr. Brangham by the 20th. of the month before the next issue of the Bulletin is published.

H.K. LEWIS & Co. Ltd.
PUBLISHERS & BOOKSELLERS.

SCIENTIFIC BOOKS

ENGLISH and FOREIGN books on the Biological Sciences can be supplied from stock, or obtained promptly to order.

CATALOGUES are issued, and will be sent post free on request.

SECONDHAND BOOKS in all branches of science are available at the Second-hand Department, 140, Gower Street. Catalogues and quotations on application.

LENDING LIBRARY

The Scientific Library lends books on the pure and applied sciences.

THE ANNUAL SUBSCRIPTION is from one guinea.

BOOKS may be retained as long, or returned as often as desired. New books and new editions are added as soon as published.

DETAILED PROSPECTUS will be sent post free on application

H. K. LEWIS & CO. LTD. 136 GOWER STREET,
LONDON. W.C.1.

A.N. Brangham(No. 18), 160. Haverstock Hill, London, N.W.3., has the following entomological books for sale:-

"THE STANDARD NATURAL HISTORY" edited by W.P. Pycraft, Warne, 1931, [illegible]pp. illustrated. A standard reference book. Published Price 15/-. PRICE...10/-.

"THE GUESTS OF THE BRITISH ANTS" by H. Donisthorpe, Routledge, 1927, 244pp. illustrated. The most complete book on this subject by the leading English authority. This book is a supplement to his "British Ants" Published Price 10/6. PRICE ....4/-.

"THE SOCIAL WORLD OF THE ANTS" by Auguste Forel, Putnam, 1928, 2 vols. Vol. 1. 551 pp., Vol. 2. 445 pp. The most complete work on the social organisation and development of ant colonies, by one of the greatest entomologists. Published Price (2 vols.) £3.3.0. PRICE.......£2.0.0.

"BEES, WASPS, ANTS, & ALLIED INSECTS OF THE BRITISH ISLES" by Edward Step, Warne, "Wayside and Woodland Series", 1932, [illegible] pp. An excellent reference guide to the Hymenoptera, by one of our most popular writers. This was his last work. Published Price 7/6. PRICE.......4/6.

"BRITISH BEETLES - THEIR HOMES AND HABITS" by Norman Joy, Warne, [illegible] 265 illustrations, [illegible] book for the [illegible] collector. Published Price 5/-. PRICE.........[illegible]

[illegible], please enclose [illegible] for postage.

BENT [illegible] INSECTS. Sturdy, [illegible] back [illegible], [illegible] post free [illegible] Road London, N.W.10.

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

Vol. 2. No. 18 July 1937

HON. EDITORS.-
B. A. COOPER,
A. N. BRANGHAM.

Dear Fellow Members,

With this number we complete our second year of existence, while our combined editorship has lasted for just half this length of time. Great as are the difficulties which still beset us, they are far fewer than those in our founder's days. One of our greatest difficulties - that of typing the stencils for the Bulletin - has been removed through the kind help of E.T. Daniels who has produced our last four numbers, and to whom we are greatly indebted. As the Hon. Editors are now able to devote more time to the Society's affairs, and can once more adopt the method of doing the typing themselves, they are glad to be able to relieve Mr. Daniels of this onus, and to thank him very much for the time and energy which he has so freely put in, to the subordination of his other interests.

Owing to the rise in the cost of paper, and other increased charges, we are compelled to make one of two economies to ensure the smooth running of the Society's finances. One of these is that smaller type is to be used for most matter, so that less paper is consumed. It will be understood, therefore, that thinner Bulletins do not mean less material contained therein, and contributors should not be in any way deterred from sending along their lengthiest productions.

We have again adopted the method of advertising ourselves in other Journals so as to be able to top the hundred mark in our membership numbers before the holidays are over. We have also received the welcome offer from a member of financial assistance in advertising whereby we repay the member if the source of advertising should prove to be successful.

It is hoped that during the coming weeks, members on holiday will call on those living in the same district. If it can possibly be arranged, we hope to make one or two outings by way of field meetings for those residing in the London district during the coming holiday season. Anyone who is interested should communicate with, or call on, B.A. Cooper.

Last month we mentioned that our member Dr. Otto Koenigsberger, was to undergo a serious operation in St. Gallen, Switzerland. We have now heard that the operation was successful, and that Dr. Koenigsberger has returned to Davos, where he will probably remain for another five months, before going back to Egypt to carry on with his work there. This month, on behalf of the Society, we will say "gute Besserung!"

Wishing you all the best of the holiday season,

Yours sincerely,

B.A. Cooper,
A.N. Brangham.

THE FRUHSTORFER BUTTERFLY COLLECTION AT S. KENSINGTON.

The bulk of the Fruhstorfer collection of butterflies, amounting to about 50,000 specimens, is being aquired by the Natural History Museum. A quarter of this collection is in Paris, part of which was bought three years ago. Its chief interest lies in the fact that it contains a large number of type specimens, many of them exceedingly rare. Among them are [illegible] [illegible], and [illegible] [illegible], both from Java, and from New Guinea, Troides goliath, which is considered to be one of the rarest butterflies in the world. Delias nausicaa comes from North Borneo, and Agrias trajanus from Brazil. Hans Fruhsorfer died in 1922, having added to his collection since starting in 1888 in Brazil.

A.N.B.

PHENOLOGICAL RECORDS, 1936.

It may be well to recall that the object of these investigations which are being carried out in their present form after consulting Dr. Williams, of the Experimental Research Station, Rothamstead, is to analyse in relation to the meteorlogical conditions the dates of first appearnace in the imago state of 50 common species of British butterflies and moths as observed by a body of experienced amateurs - of whom there are about a dozen in the S.E. District and several in the N.E., N.W. and Midland (including Gloucester) Districts. In the case of the S.E. District, the number of years, as well as the number of observers, have enabled average dates to be calculated and plotted on diagrams on which are also plotted the actual dates for the different years.

The observations of 1936, which plotted, are of special interest in that they appear to confirm conclusions which hitherto have only been put forward in a tentative manner.

Summarised, these previous conclusions had been:-

(a) Except in cases where the persistence of a certain type causes a gradual growth of forwardness or lateness, or a gradual change over from one state to another, it seems clear that early emergence depends on the occurrence of a warm period within a certain time distance in advance, until a critical point is reached when the end of the warm period fails to induce emergence in the later insects. Late emergence, on the other hand, occurs when the normal date falls within a cold spell and is limited by the arrival of the next spell - sufficiently warm to induce emergence - and as the normal dates get later the ultimate lateness gets less.

It has been seen that the response of the insects to sudden fluctuations may be very rapid, resulting in one being appreciably early while another separated only by a few days in normal date becomes appreciably late, and it also seems clear that the same influences which effect separation into earliness and lateness between adjacent insects, in the order of normal appearance, must also frequently interrupt the period of emergence of a single insect, and in such cases it is not necessary to regard the isolated or scarce early specimens as "freaks".

(b) It was pointed out that in the droughty year 1933, the degree of earliness in the N.W. District was markedly less than in the S.E., although the temperatures throughout the winter, spring and summer were practically the same in each case. The drought, however, was more severe and the sunshine less in the N.W. District. A case of greater earliness in the N.W. District coincided with a wet period following a long period of drought.

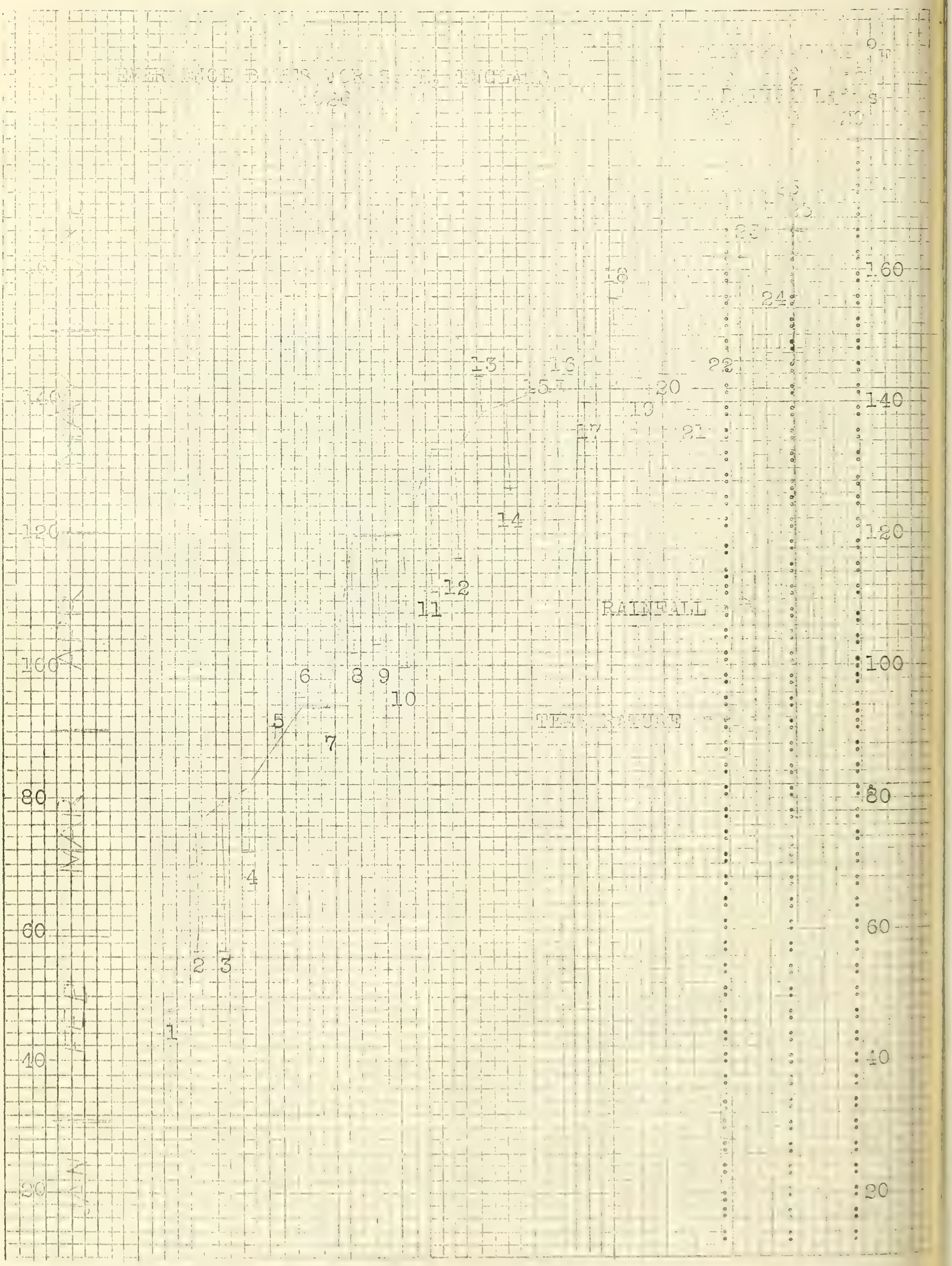
From a careful examination of the records of different years it appeared that while, in the absence of exceptional drought, excess temperature is the principal factor in producing earliness, the maximum degree of earliness is often found to occur during a warm period which coincides with, or follows shortly after, a wet period.

The year 1926 afforded a good example of this combination. (For diagram see next page).

(c) In dealing with 1935, the exceptionally cold period in mid-May was referred to as driving a wedge between insects adjacent on the list, between observers' dates for the same insect and, no doubt, between individuals of the same species in the same locality. Attention was also drawn to the fact that, while certain species, according to the weekly average temperature graph, had apparently emerged under adverse conditions during cold spells, a reference to the daily temperature records showed that at about these points the minimum daily temperature had risen to and above the normal.

(d) In dealing with 1932 it was remarked that *P. rapae*, the pupa of which is bare and exposed, emerged within a cold spell, but during a period of excess sunshine.

Turning now to the past season, 1936, Diagram A., on the next page, gives



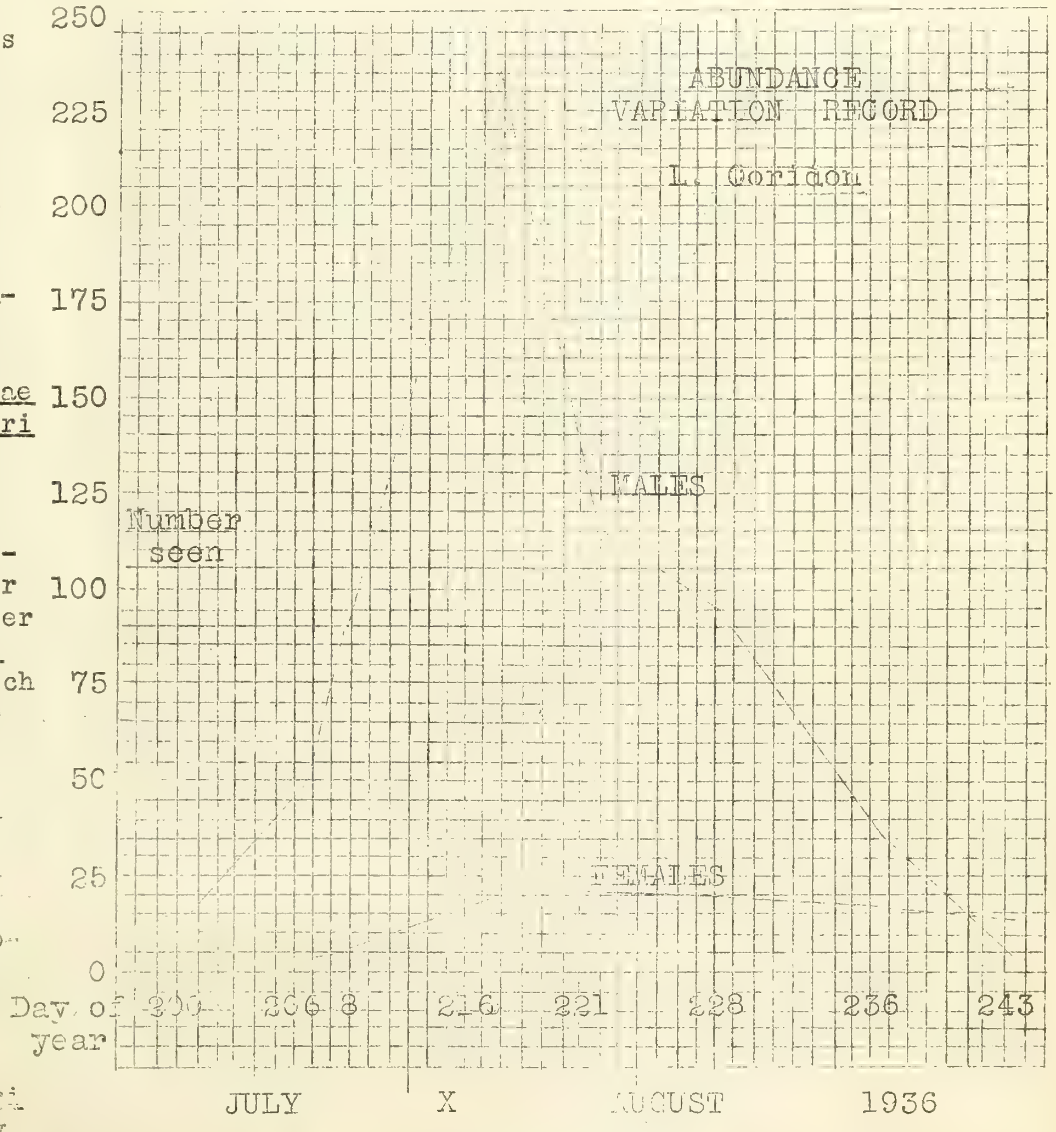
the usual particulars for the S.E. District in the simplest form. The weather, on the whole, was variable and abnormal. Following a cold snap shortly before Christmas, 1925, warm, wet and cold, dry conditions alternated, and up to the third week in March the state of the season as regards plants and insects, was approximately normal, after which a warm, moist period began to produce forward

April was the coldest for 14 years, with rainfall and sunshine below the normal, and initiated a drought which lasted, at Rothamstead, from the 26th. until the 17th. May, the latter month being the driest May since 1896, with the temperature slightly above normal. The second half of June was remarkable for torrential rain associated with thunderstorms and heat; July was cool, wet and sunless, but in the course of August there was a marked increase of warmth, dryness and sunshine; September was dull and rather wet, and the season ended with a cold and dry but sunny period in early October.

The well-defined warm spells (associated with or following wet-periods) produced the usual bursts of forwardness in insect emergence.

Diagram B./(not shown), which gives the first three dates of different observers for each species, also indicates that where certain species have apparently emerged during a cold spell, unbroken according to the weekly average, there had actually been a rise in the minimum daily temperature to or above the normal, similar to the cases noted in 1935. In addition to the examples in the clearly-defined cold spells in April, May-June and July-August, there were a few cases of emergence during the cold spell in early October during a period of rising minimum temperature which did not, however, reach the normal. This recalled a similar significant case which occurred in the spring of 1919, when detailed meteorological particulars were plotted, and which is illustrated in a section of that year's diagram referring to theappearance of T. stabilis at the end of a cold spell during a rise of minimum daily temperature towards the normal.

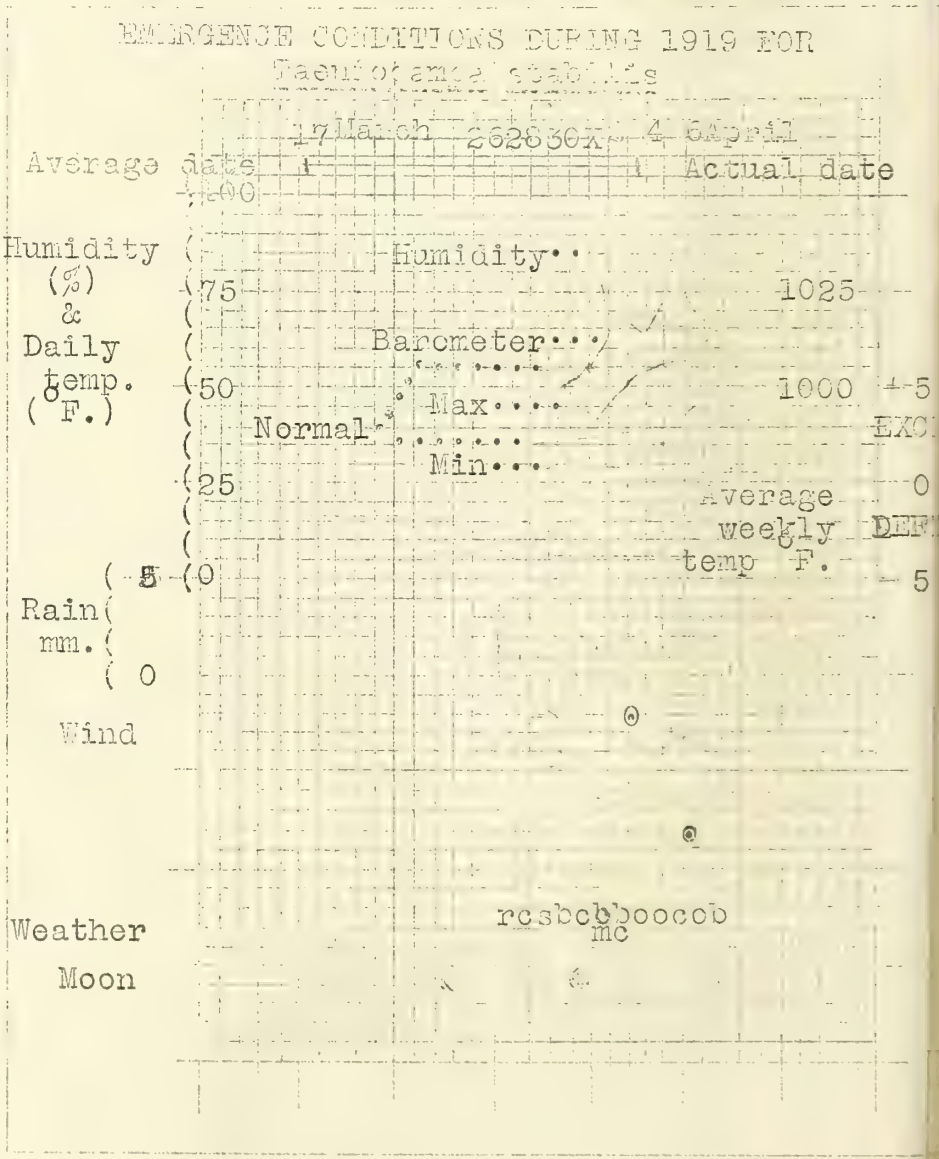
In future it is proposed to include continuous daily temperature graphs in these diagrams. Diagram B. also draws attention to two extreme cases of interference with emergence which occurred in the cases of P. rapae and S. menthastri caused by the cold spells in April and May-June respectively, One observer in the S.E. after noting P. rapae on the 24th March did not see another specimen until the 28th April, a period of five weeks, this being confirmed by the break in the observations of others. In the second case an observer who noted menthastri on the 16th May saw no other specimen until the 11th June, a period of nearly four weeks; in this case there were, however, three intermediate dates when this insect was noted by other observers, two of which occurred during the rise in minimum daily temperature.



It seems clear that such a wedge, which is liable to be driven through on the continuity of its abundance.

With regard to the second broods, it will be seen that most of the emergence dates correspond with the preceding warm, moist spell or with the subsequent short period of relatively high minimum temperature. Further use has been made of the diagram for the S.E. District by plotting on it all the dates of observation obtained from the other districts and corresponding meteorological particulars in the cases of the N.E. and N.W. Districts. This has been done to bring out a point which may not be generally appreciated - the tendency of insects which, on the whole, appear later in the North during the spring and summer, to become quite as early or earlier than in the South in the autumn in order to adjust their life cycle to the earlier onset of winter. Specific examples of this [illegible] are afforded by [illegible], seen in Scotland this year on [illegible] [illegible] with [illegible] July in England S.E. (average date 12th August). It has been [illegible] that [illegible] and [illegible] (average dates 20th and 24th September in England S.E.) are never later than 10th September in the [illegible] district of N. Yorks.

[illegible] [illegible] [illegible] regards [illegible] and the cold spells which have already been referred to, and it is interesting to note that the only intermediate emergence in the case of No. 6 occurred during a week when there was excess of sunshine which was absent in the S.E. - a comparable case to that quoted of this insect, P. rapae, in 1932. It should be mentioned that in the N.E. and N.W. Districts, certain species have been included in substitution for those on the original list which are absent or scarce in these Districts.



At the end of the present season it is intended to construct diagrams for each of the Districts as sufficient data should be available by then to warrant the calculation of averages. In the meantime, the results of such analysis as is so far possible are circulated in these Districts

ABUNDANCE VARIATION RECORDS - 1936.

It has been considered that, in addition to the accumulation of information referring to first appearance dates, it should be possible to widen the field by a systematic investigation of variations in abundance of our indigenous Lepidoptera, and their causes.

At the outset it appeared necessary that the following considerations should be taken into account:-

[illegible] (CHALK HILL BLUE)

LOCALITY: [illegible] S.E. (Exact locality to Committee only).

METHOD: No. per defined distance walked (500 yds) & [illegible] side

DATE (OVA August-April PUPA June (21 days)
HISTORY(LARVA April-June (63 days) IMAGO July, August

OBSERVATIONS

	JULY			AUGUST				
NUMBER SEEN: MALES:	15	[illegible]	[illegible]	[illegible]	[illegible]	94	37	6
FEMALES:	0	[illegible]	[illegible]	[illegible]	[illegible]	20	[illegible]	14
NOTES	sunny	[illegible]	[illegible]	sunny	sunny	sunny	sunny	sunny

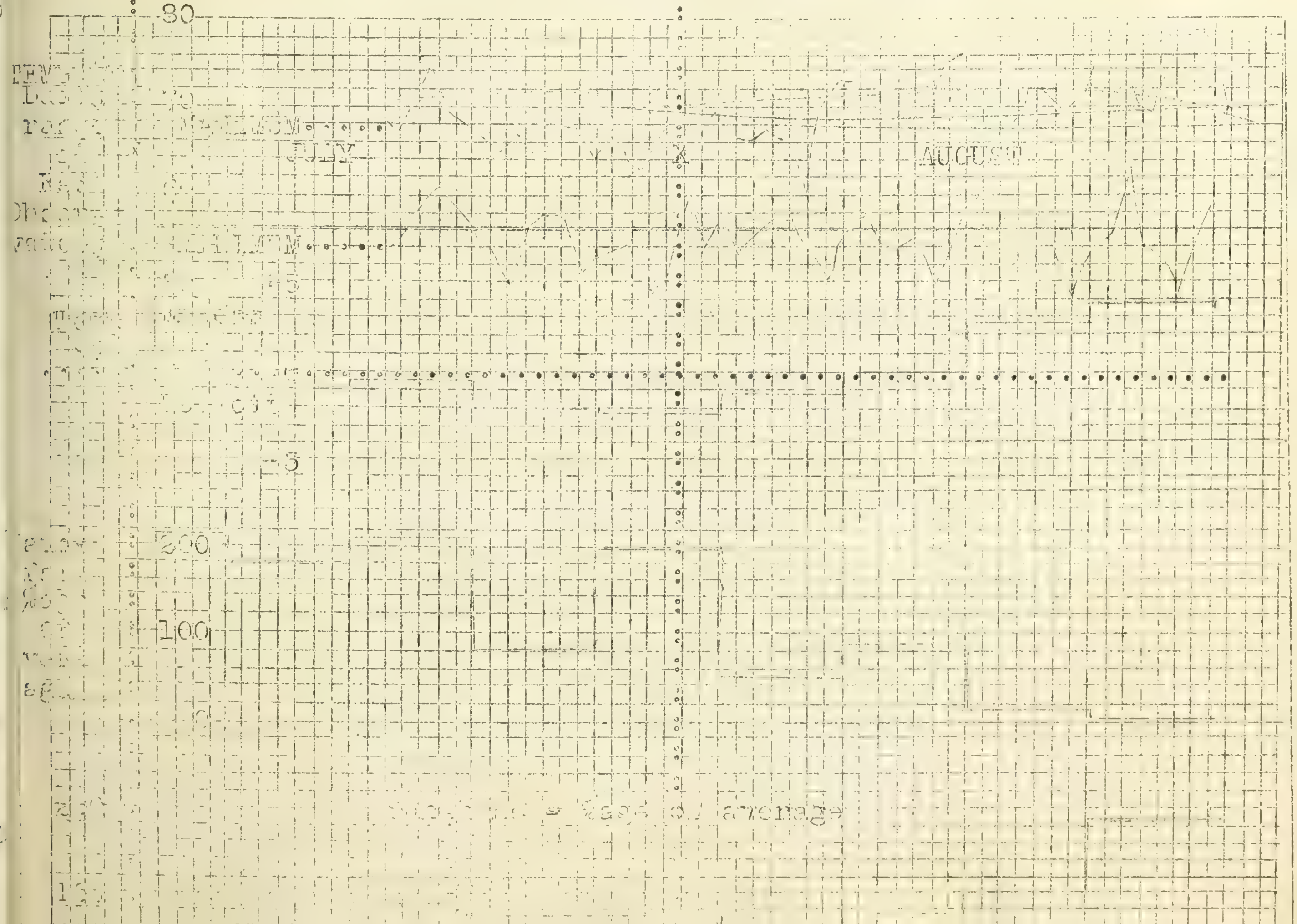
All observations were made between 10h. and 11h. GMT.

RECORDER: H.C. GUNTON

LOCAL METEOROLOGICAL CONDITIONS ON DAYS OF OBSERVATIONS (10h.-G.M.T.)

	JULY			AUGUST				
Temp. °F								
Humidity %	65	65	55	63	75	65	45	55
BAROMETER (MB. (	1007.8	1010.6	1015.0	1010.1	1024.3	1016.3	1029.2	1022.8
WIND	SSW6	SSW5	SSW4	WW4	N3	SES2	NNW2	WNW3

DISTRICT METEOROLOGICAL CONDITIONS



1. In the case of an indigenous insect each period of its existence as ovum, larva, pupa and imago must be considered, since the ultimate abundance of the imago may depend on the effects of weather and of natural enemies at any or all of these stages.

2. Some definitely simple and statistically sound method of computation should be adopted which must be suited to the habitat and habits of each species selected.

3. The habitat should be selected having regard, inter alia, to its freedom from disturbance for agricultural or other purposes.

4. The species selected should represent all the principal variations of life-history, such as hibernation in the ovum, larva, pupa and imago state, and the occurrence of single and double broods or multi-broods.

5. While it might appear desirable only to use insects already included in the First Appearnace list, the conditions are different in the new investigations now proposed. In the former case, widely distributed common insects, easily observed, were necessary, but these in many cases are not the easiest to count. In the latter case it appears important to choose insects which a comparatively few reliable observers who participate consider they can count in favourable positions which are readily accessible.

6. The method of recording observations should not only facilitate the comparison of day-to-day observations of each individual observer, but also of different observers.

7. Loose expressions of comparative abundance should be avoided and actual numbers or symbols denoting numerical limits should be employed.

8. As regards special attractions, natural ones corresponding to different periods of the season (e.g. sallow, bramble and privet, clover and lucerne, hemp agrimony and ivy) should be explored, and sugar, garden flowers and light, whether in the form of street lamps, illuminated rooms or moth traps, should be employed as supplementary means and for species which cannot be otherwise observed

As the scheme does not aim at assessment of actual population but of variation in abundance and its causes, the method of observation and record was designed with a view to giving collaborators the greatest latitude, having regard to their local conditions, without impairing the possibility of comparing and combining their results.

In this case also, the advice of professional experts was sought, and it is desired to take the opportunity of acknowledging the assistance of Professor Buxton, Professor Brunt, Mr. Elton, Professor Munro, Dr. Richards, and Dr. Williams, and thanking them for so kindly finding time for a joint discussion.

Concurrence having been obtained, a commencement was made in the 1936 season.

There cannot, of course, be any analysis of results of the first season's observations, but the following information may be of interest, and will indicate the nature of the assistnace which is required.

In order to gain useful preliminary experience, a list of insects was prepared which will probably be curtailed. One or more reports have been received in respect of each of the following insects:-

T. stabilis, E. cardamines, A. euphrosyne, X. montanata, P. icarus, A. selene, T. viridana, A. paphia, A. hyperanthus, Z. filipendulae, X. monoglypha, X. circellaris, A. lychnidis, and C. vaccinii by one or more of the following observers:-

Dr. G.V. Bull, Brig.-Gen. Cooke, H.C. Gunton, W. Rait-Smith and C. De Worms.

Example - L. coridon - Chalk Hill Blue,

has been selected to illustrate the method of observation and its tabulation with the meteorological conditions for comparison with the corresponding particulars of future deasons.

It is, of course, realised that the meteorological history of the past winter and season must be taken into account as well as the simultaneous or immediately precedent conditions; also that there are other factors, such as the effects of parasites, which will have to be studied and which will probably present very considerable difficulty. The co-operation of any who are making a study of the Ichneumonidae which prey on lepidopterous larvae would be most valuable.

Having regard to the importance of studying the many reactions to environment, it is very much to be hoped that we shall soon have an Inter-Society

Committee which might be a half-way house to a Phenological-Ecological Society, which would enable amateur workers in these fields to find an outlet without having to join several societies.

It should be mentioned that these two researches are now being aided by a Government Grant which has been placed at the author's disposal last summer. This was done by the Government Grant Committee of the Royal Society.

MAJOR H.C. GUNTON.

oOo

CALENDAR

LEPIDOPTERA - late July and August:

The season is now half over and numbers of species on the wing are already commencing to dwindle. Nevertheless, some aspects of moth-hunting, for example, sugaring, or as some prefer to call it, treacling, now reaches its height.

From personal experiance, I have found that the particular items used in making up the mixture do not matter much, the most important factors being a suitable pitch and weather. As regards the former, outskirts of woods, edges of ponds, cliff tops, and hedgesides are as good a variety as one can choose from, but, of course, this will depend on what one is after and what country is available. In very dry weather I have found that best results are given by damp districts such as moist glades in woodlands, reedy pond sides, dewy meadows and watery pastures. Thundery weather is the very best it is possible to obtain, provided the rain is not too hard, but as a rule still evenings are of very little use at all.

Coming to the preparation of the sugaring mixture, we have a large assortment to choose from. I find it perfectly satisfactory to add 20ccs or more of methylated spirits to a 2lb. tin of black treacle and mix well, during autumn and early spring adding a few drops of amyl acetate to the solution just prior to use. For the benefit of those who do not hold with my views as to the potency of so crude a mixture, here are other recommended suggestions (I have tried numerous of these, sugaring alternative posts with them, but with no observed differences):- foots sugar, boiled to a treacle with water, beer, rum, and even whisky being added to taste when cool (to avoid evolution of the alcohol before the time comes for use); honey is frequently used, as also are the juices of stewed fruit and sweet-smelling fruit essences. Sugar phosphates have been made use of with some measure of success, I understand, while other organic compounds are frequently used to give the mixture a rich aroma.

Perhaps I may be allowed to digress here in order to quote the following paragraph which appeared in our local excellent, the "Willesden Chronicle", for May 31st. last (with due apologies to any of our members who may happen to be journalists!): "A simple method of capturing butterflies alive is adopted in Japan. Trees are covered with a preparation of phosphoruus and wet sugar. At night, the phosphorous attracts the insects, which stick to the sugar-smeared boughs. The collector can then leisurely removed them." A note to the paper concerned has failed to elucidate anything further!

To continue, although golden syrup is often used, it is probable that the strong smell of treacle has its advantages. In this connection, I find that the brand of black treacle sold by F.W. Woolworth (2 lb for 6d.) is both stronger smelling and cheaper than that made by Fowler (2 lb for 7½d). I forget the name of Woolworth's brand, but it is the only one they keep as a rule. Unfortunately, it is only stocked for short periods throughout the year, so I always by up a large supply when available.

As to the painting of the sugar on fence posts, treetrunks, knots (bunches of reed, grass or flower heads tied into bundles), it should be remembered that it is well to do this before dark so as to have it finished before dusking commences (contrary to the advice given in some popular books suitable for beginners). Again, should a strong wind be blowing, it need not mean a bad night, but sugaring should always be done on the leeward side of a fence or tree if that is possible. A strip several inches wide isnoften recommended, but the solution will always run down the tree however viscous it may be. Unless the weather is exceptionally good, catches will be found to increase progressively from the first night of sugaring in a locality for several nights. Many collectors get someone else to sugar their pitch before they leave, so that it will be in the best condition on their arrival a few days later.

When examining the catches, a dim light is absolutely necessary, preferably fixed on to one's person by some means or other. After a good feed the insects often wander round to another side of the tree or post, which should be glanced at before going on. A net stretched between two prongs in a Y-piece is very useful for holding beneath the sugar patch on a tree trunk or post to catch specimens which fall off when the light is switched on.

Ragwort blossoms are well worth examining at this season. The best plan is to [illegible] the heads over an upturned net without switching on the light, and to sweep upwards after any that take wing. A light invariably scares off a large proportion of specimens.

B.A.C.

OOO

[illegible]

[illegible]

[illegible]

[illegible] gives it as his view that it should not be difficult to establish Papilio machaon (English Swallowtail) in various places throughout Britain where little or no marshland occurs. He mentions having seen this species on the top of the chalk hills near Rouen, whither it may, however, have wandered from the river-[illegible]

Here are South's remarks on the subject (Butterflies of the British Isles, 1907, p. [illegible]):-

"This butterfly was known to Petiver and other early eighteenth-century entomologists as the Royal William. There is every reason to believe that at one time it was far more widely distributed in England than it now is. Stephens, writing in 1827, states that it was formerly abundant at Westerham, and gives several other localities, some very near to London.

"During the last forty years or so, the butterfly has been seen on the wing, from time to time, in various parts of the Southern and Midland counties. Caterpillars have also been found at large in Kent and other Southern counties. Possibly attempts may have been made to establish the species in certain parts of England, and the presence of odd specimens in strange places may thus be accounted for. Or such butterflies may have escaped from someone who had reared them.

"On the Continent the butterfly is common in woods as well as in meadows, and even on mountains up to an elevation of 5000 feet. It occurs, also, but less commonly, at much higher altitudes. It therefore seems strange that in England it should be confined to the low-lying fens of Norfolk and Cambridgeshire. Such is the case, however, and a journey to one or other of its localities will have to be made by those who wish to see this beautiful creature in its English home."

Its distribution extends from Europe to China and Japan, and it is also found in North Africa.

The reason for its restricted range in Britain, however, appears to be the fact that its favourite foodplants belong to a marsh association. These are Peucedanum palustre(Milk Parsley), and Angelica sylvestris(Angelica). Fennel (Foeniculum vulgare), a third favourite, is not a generally common plant, being found in waste places, and especially near the sea. The butterfly is also known to eat the widely distributed Daucus carota(Wild Carrot), Heracleum sphondylium(Cow Parsnip), and Peucedanum sativum(Wild Parsnip), apparently, however, not liking these much in a state of nature.

It seems unlikely, also, that it would be possible to introduce the Swallowtail butterfly artificially unless its foodplants were at the same time distributed over a fairly wide area. Otherwise, an insufficient number of butterflies would find the original breeding patch on which to lay their eggs and so continue the colony in its former strength.

It might be as well to state here that local naturalists' societies who are making lists of the fauna of their district do not approve of the release of non-indigenous (i.e. not locally wild) species, as it tends to make their lists valueless. However, as the distribution of this species has been pretty completely worked out. The only other objection likely to be raised to the introduction of this species is that one of its foodplants is the carrot. It would be as well not to attempt to do so in the vicinity of market gardens or allotments. Perhaps someone with experience of Broadland gardens can tell us whether the [illegible] Butterfly has been known ever to be destructive to this crop.

E.T.D.

[illegible] Mr. Cooper's article certainly makes good reading, even if one is a little doubtful as to the ultimate success of his scheme. Part of the trouble seems to be that in this country the larva of P. machaon is much more fastidious in the choice of food than is the case with Continental examples, as, although in captivity it will thrive on all the plants listed by Mr. Cooper, in a natural state the eggs are invariably laid on Milk Parsley (Peucedanum palustre) or its marshland allies; certainly I have never heard of the caterpillar occurring on carrot in Broadland gardens. Possibly an attempted introduction might meet with more success if Continental specimens were used in the experiment. Another point which ought to be borne in mind concerns the habits of the female as regards oviposition. She likes great tracts of fen to roam over, and generally lays not more than a single egg on each plant selected, as I once had occasion to appreciate very thoroughly when I followed a female from plant to plant collecting each egg as it was laid. I had to wade through a dense tangle of marsh plants for a long way indeed to get a dozen eggs.

Still, it is quite possible that the Swallowtail might settle down in what are believed to be some of its old haunts if it were given a fair chance, and, in this connection, readers of Mr. Frohawk's "British Butterflies" will be delighted to learn with what success the attempted introduction of Lycaena dispar rutilus, the Continental form of our old English Large Copper, has met. There is a flourishing colony in Southern Ireland more than twenty years old and another at Wicken Fen of L. dispar batavus, a Dutch insect. Unfortunately, similar attempts to introduce the latter species in the fens around Woodbastwick in this country have failed. Ten years or so ago females were brought from Holland and liberated in a specially prepared piece of fen, where they soon settled down comfortably and commenced egg-laying. These eggs in due course produced larvae, which, hibernating successfully throughout the winter (although some of them were submerged for 60 days!), produced imagines in the following summer, but although another brood was reared the following year, the colony, which seemed to be satisfactorily established, died off for no accountable reason.

E.T. DANIELS.

o0o

HINTS FOR BEGINNERS.

A series of short articles dealing with all aspects of practical entomology in a simple and instructive manner. Suggestions from members on any subject they would like dealt with in this series will be welcomed.

No. 2 BOOKS.

Books are essential to the collector and it is hoped that the following short list will afford the beginner some guidance in the selection of those volumes which will be of most use to him. Many hundreds of books have been written on the subject and the following have been selected as being those likely to assist the beginner. The first four volumes are almost indespensible and should certainly be obtained. Most of them are usually to be had second hand at slightly lower prices.

1. THE INSECT HUNTER'S COMPANION. Rev. Joseph Green. 6th. edition. Allard & Son 3/6

An indispensible and valuable work which should be in the hands of every beginner, contains explicit instructions for collecting and preserving all orders of insects.

2. BUTTERFLIES OF THE BRITISH ISLES 7/6
3. MOTHS OF THE BRITISH ISLES Series 1 } 10/6 Richard South.
4. MOTHS OF THE BRITISH ISLES Series 2 } 10/6

Frederick Warne & Co

These books were reviewed in Bulletin No. 13; they are certainly from all points of view the best popular work on the subject and contain coloured figures of every species.

5. BUTTERFLIES AND MOTHS. W.S. Furneaux (12 coloured plates) Longmans Green & Co. 5/-.

A useful and well illustrated work specially written for the young entomologist; in addition to much practical matter all the butterflies are figured and described as well as the commoner species of moth

6. BRITISH BUTTERFLIES. J.W. Tutt. 1906. George Gill and Sons.

Although this book is to a large extent superseded by Mr. Frohawk's more recent publication, it contains much useful matter and deals very exhaustively with the subject. It is now out of print but second-hand copies are usually to be obtained.

. THE COMPLETE BOOK OF BRITISH BUTTERFLIES. F.W. Frohawk. 1934. Ward Lock and Co. Ltd. 10/6.

A small edition of the author's work "Natural History of British Butterflies" deals fully with the life-history of all our butterflies, magnificently illustrated.

8. TEXT BOOK OF BRITISH BUTTERFLIES AND MOTHS. Newman and Leeds. 1913. Gibbs Bamforth, Ltd. 5/-.

A well arranged and practical hand book, gives in tabular form under each species (English names) time of occurrence of each stahe of the insect, its food-plant and locality, also a complete index of English and scientific names, a very useful adjunct.

9. ENTOMOLOGISTS' LOG BOOK. Alfred George Scorer. 1913. George Routledge & Sons, Ltd. 5/-.

Of great value to the field worker. An epitome of the facts concerning the British Lepidoptera arranged alphabetically under both English and scientific names.

10. HINTS TO THE FIELD LEPIDOPTERIST. (Three parts). J.W. Tutt. Elliot Stock. 6/- per part.

This work contains thousands of useful hints mostly reprinted from the Entomologist's Record, of which the author was for many years the editor, together with much useful information not to be found elsewhere. Parts one and three are still to be obtained but part two is scarce.

11. THE ENTOMOLOGISTS' BULLETIN. Published by the Amateur Entomologists' Society. 3/6 per annum.

A periodical which caters specially for the beginner and to which every collector should subscribe both as reader and contributor.

12. METHODS OF MOTH COLLECTING. Watkins and Doncaster. 3/6.

13. DAYS WITH A BUTTERFLY NET. Watkins and Doncaster. 3/6. J.H. Bell.

Two books written in a light manner and with many hints suitable for the less advanced lepidopterists.

S.G. ABELL.

oOo

MUTATIONS AND RACIAL CHANGES DUE TO DIFFERENCES IN THE ENVIRONMENT.

Dr. K. Jordan, as Curator of the enormous Rothschild collections, has, probably, had an unparalleled opportunity for the study of local races. In his Presidential address to the Entomological Society in 1931, he said: "In all groups of insects - and practically in all classes of animals - subspecific characters and territory go hand in hand; is the combination that of cause and effect? Observing geographical variation to occur in nearly every widespread species and finding all gradations in the quantity of difference, I am quite ready to answer the question in the affirmative; the subspecific characters are produced by a factor or a combination of factors in the environment acting upon and altering the nature of the population which has come into existence in the newly occupied territory."

These local races occur most frequently in islands, but they are also found in Continental areas, for instance, there are different races in East and West Africa. These local races, as well as the Eastern and Western floras, meet and mingle in Uganda.

Besides local races, there occur in many islands peculier species found nowhere outside these islands. These species (usually) have obviously diverged from others inhabiting the neighbouring lands, but are so [illegible] that often, no one questions their right to specific rank. Not infrequently an island may possess, in one group, both a peculier species and a local race of another, more widely-spread species. Sometimes it is possible to show that the local race differs from the neighbouring races by the aquisition of just those characters which mark the peculiar species, though developed in a lesser degree. No one doubts that isolation is a factor in the production of these peculiar island species.

Why should both the peculiar species and the local race, aquire the same unusual characters in the particular island? If we follow Dr. Jordan, we ascribe this to the conditions of the environment; and surely, we might deduce, that if isolation is continued for a sufficient time, a new species will be produced?

We might, then, ascribe the existence of closely allied species to the interposition of barriers between sections of a race, when the divided sections diverge, and the removal of these barriers when they are able to mix again.

The mutationists claim that a mutation must always first occur, but they admit that the picture, universally presented by Nature is one of slow, gradual, change.

Surely in the case of local races differing on the same lines as peculiar species, there is no room for a mutation plus Natural Selection working on an [illegible] of years to produce a form adapted to factors in the external environment?

The mutations, which have arisen in the Laboratory, appear, usually, to be characterised by a lack of something, pigment, or eyes, etc, Sometimes, there is a [illegible] of material, such as a fusing together of the ends of the X-Chromosomes, which produced a giant race of Drosophila.

Stags once had no horns, now they have horns, and, in many different environments.

Judging by the analogy of local races and species of butterflies, I should imagine that some factor in some environment started the growth of stags horns, and eventually, this became registered in the germ cells, as an additional gene or an excressence on a chromosome. That is, there was a permenant addition to the racial make-up, due to the reaction of the protoplasm to an environment.

This, I take to be the normal way in which new species are formed in Nature (from a study of the world development of groups in connection with Geography and Geology).

Mutations, on the other hand, I imagine to be merely a re-arrangement of exisiting material, without any addition from outside. Usually there is a loss of something. For instance, the addition of the chromosome, which I have supposed that the stags aquired, and which gave them horns hereditarily in any environment, might get shaken loose, as a result of a jar to the system, administered by X-rays, or poison, or any other means. Then a hornless race of stags would appear "by a mutation". There is much evidence to show that many of our species are, at any rate, hundreds of thousands of years old. So it would be very surprising if, even in an experiment lasting 100 years, we could produce a change that would remain permenant in all environments, except as the result of a mutation.

If this is the case, we must judge by the experiments, which Nature herself has made and bequeathed to us, in the form of these local races and species.

R.J. Williams in "An Introduction to Bio-Chemistry" says, "Chemical evidence indicates that each type of organism has at least its own peculiar proteins, and perhaps other constituents, which are also peculiar to the species".

He also says, "Certain dyes and various salts have been shown by analytical studies to pass into and out of cells". It would, therefore, seem to me likely that both physical and chemical factors produce these alterations (additions and decreases). And, if the causes affect the whole race for a sufficient period, the effects persist, even when the environment is altered. So, we should have a whole race gradually transformed through an addition (or diminution), produced through the factors in the environment.

Whilst Mutations are a quite different sort of phenomenon, and take effect suddenly. They involve a mere re-arrangement or loss of existing matter, and affect one or a few individuals only, as a rule. If the cause is widespread there may be a larger number of mutations. Usually they result in the production of some sort of deformity.

G.K. HEBBERT.

oOo

[illegible] many of our members may not understand some of the terms contained herein, a few are explained briefly below.

SPECIES and GENUS:- The concept of genus and species is very easily understood but not easy to define. The reason for this is that the characters on which these are laid down vary with the organism. In Lepidoptera, among other things, wing venation may serve to define genera, while wing pattern may serve to separate species. (This is just an example - more than one feature is always required to raise an insect to specific rank). In, shall we say, the worms, however, there are no wings to choose from. It will be seen from this that our definition will have to be very elastic - in fact, no adequate definition has yet come my way. Suffice it to say that a species consists of a number of individuals showing certain more or less fixed characters, belonging to a genus, family, order, phylum, etc., according to progressively fewer but more important points in their structure. Thus: phylum: Arthropoda; class: Insecta; order: Lepidoptera; family: Pieridae; genus: Pieris; species: rapae; variety: novangliae, and so on, subspecies, varieties, aberrations, local races, and similar subdivisions depend to a large extent on the author dealing with them.

MUTATION:- The offspring of two identical parents in general are like their parents. A certain amount of variation generally takes place according to methematical laws, between certain extremes. The offspring of unlike parents (within restricted limits so as not to produce sterility) follow definite mathematical laws, originally formulated by Gregor Mendel, and since greatly augmented by later workers. It has been shown many times that by selecting, say, the largest specimens (or those with any other character) that the amount of variation in a given direction can only proceed up to a certain limit. However, "freaks" are constantly being found or bred well outside these limits (they are rare occurrences) and these are termed mutations. From a mathematical outlook it is obvious that 99.9% of these will be hindrances to the continuation of the animal's existence, and if it reaches maturity no offspring will result, or if eggs are laid, they may prove to be sterile. This has been found to be due to unequal grouping or "seggregation" of the germ cell CHROMOSOMES during the reduction division which takes place before fertilisation can occur. These (chromosomes) are peculiar masses present in nearly all cells, of which all living bodies are made. In every species, there is a constant number and shape (opposite sexes usually distinct), which separate out and take up certain positions before a cell division (called "mitotic") takes place. However, in fertilisation, two cells join to form one, and unless something peculiar takes place, there would be twice as many chromosomes in offspring as in parent. It is found that in animals the parent cells undergo "meiotic" or "reduction" division in their reproductive cells (i.e. chromosomes are halved) and it is this process that causes the sexes to be determined. If in a mutation the chromosomes do not pair off [illegible], or additions or reductions take place, the offspring may be unable to pair off even sets of chromosomes in meiosis and may therefore become "sterile". It is to this category that many mutations fall. In the case of Primula kewensis, a hybrid between two species in which this occurred, after some time became fertile, and was found on examination to have doubled the number of its chromosomes, i.e. having two identical sets [illegible] could now divide evenly as in [illegible].

It has been shown that the factors which make an organism what it is, and not some other species, are carried by the chromosomes. It can be shown by observation which factors lie in which part of which chromosomes, and the chances of rearrangement may be calculated.

In just the same way as aneurin (Vitamin B) is necessary for co-ordination between muscular and nervous systems, its absence causing such deficiencies (difficiency diseases) as beri-beri and gastric ulcers, so too will the presence of various chemical substances in alternate foodplants cause possible changes in the bodily metabolism and thereby differences in structure or chemical make-up (shown in difference in size, colour, etc., of the specimen). Since the chromosomes are unaltered, offspring reared on original foodplant are found to have reverted to the original form. One view has it (put forward by supporters of Lamarck's theories) that these physiological modifications may be taken up by the chromosomes and become inheritable. Another line of difference between the mutationist (who considers all inheritable variation to be due in the first case to mutation) concerns that of island species and races. It is noticeable that inhabitants of various environments often bear [illegible]. The Lamarckist attributes this vaguely to the effect of the environment, while the mutationist attributes it to mutation and subsequent selection of the least suitable by the [illegible]

[illegible]

In reading these notes, I hope members will not take them as being the words of an expert on the subject, which I certainly am not. They are written in the hope that some of those who may consider the article unsuitable for a magazine intended primarily for beginners will find it to be of sufficient interest to stimulate them to read further on this subject and to broaden their knowledge outside their present particular line.

B.A.C.

oOo

We must apologise to Major Gunton for the insertion of Plusia gamma as the eighth species in the list of insects for phenological recording in the April issue. This, of course, is a migrant and, as such, is not strictly comparable with the remaining resident species and should therefore be deleted. We trust that no inconvenience has b been caused.

We are also sorry that we are unable to reproduce the complicated diagram of Major Gunton s which should have filled this page. Possibly we may be able to do so at some later date. (EDS.)

oOo

DON'T touch newly hatched larvae with the fingers.....Use a camel hair paint brush for transferring them from one place to another or some may be accidentally crushed. Again, NEVER interfere with them until they have completely left the vicinity of their egg-shells..... It may be a necessary first meal.

DON'T interfere with larvae newly moulted or just about to moult .....They too are too delicate to withstand much much handling.

DON'T let your pupae get too dry or go mouldy. Keep dry in a cool closed tin till about a month before they are due to emerge, then place in sterilised moss or bulb fibre ("PUPATO"). This must remain moist, but should be kept in a porous (i.e. of perforated zinc or wire gauze) container (to prevent mildew) and not left in a still atmosphere. It is as well to water every day or two as a precaution against over dryness. With many species it is fatal to expose to too much light, but others (e.g the clearwings - Aegeridae) will not emerge except under the influence of early morning sunshine.

NEVER forget to place suitable sticks in the pupa box for the newly emerged imagines to climb up, or you will breed cripples, and for the same reason, remove empty pupae and cocoons from the surface of the fibre as the insects have a habit of trying to dry their wings on these. Furthermore, do not bring pupae into the warm unnecessarily .....The mortality is usually greater than it is worth. While in tins it is essential that the pupae should be kept in a cold and shaded spot.....This applies also to the keeping of ova and some hibernating larvae.

EXAMINE the moss and bulb fibre from time to time to see that it has not been invaded by mites, spiders, or clothes-moth larvae. It must immediately be burnt if mould is suspected. A moat of water round outdoor breeding appliances very successfully keeps animal invaders at bay, but this is not always easy to obtain.

When feeding larvae in breeding cages, do not trouble to move them off the old food on to the new; They will usually do so of their own accord in a few hours, the old food being removed the next day..... Larvae may easily be hurt by forcibly pulling them off a twig or cage-side.

When the foodplant is placed in a small pot of water, see that there are no spaces down which the larvae may pass and so get drowned (this usually, for obvious reasons, occurs just as full grown, when about to pupate). A muslin square held on by elastic or soft string, and pricked with holes the exact size of the penetrating stems is sufficient for all but the smallest larvae.

REMEMBER that most British Lepidoptera pupate underground; therefore cover the floor of the jam-jar or breeding-cage with a layer of earth or bulb-fibre or even sawdust. This also absorbs condensed or excreted moisture and aids in maintaining a constant humidity in the air.

B.A.C.

MARKED BUTTERFLIES.

To ensure the recognition of individual butterflies (and hence to obtain exact information of their movements) some definite means of marking is required. After trying several methods I now use one by which each individual butterfly is alloted a separate register-number composed of an initial letter and a series of numbers: thus, R. 357, where "R" stands for Rodborough (the place where marked) and "357" for the serial numbers of the butterfly so marked. Any combination of letters or figures may be used and these may be in different colours, so that a large range of serial numbers is possible without duplication of any one number.

The process of marking is simple. In the case of a "White" butterfly I paint its number on its right forewing with a small brush dipped into an alcoholic solution of basic Fuchsin (magenta) and then mark its underside (usually by painting three stripes across each hindwing), so that, when at rest, the butterfly is readily seen to be a marked one. In the case of butterflies such as _Vanessa atalanta_, where a painted number would not show up on the dark ground-colour of the wing, the number is written on tracing paper in waterproof drawing ink and is stuck on to the upperside of the right forewing with Canada Balsam, a small patch of scales having been rubbed off so that the label is attached to the wing-membrane (if this is not done, the label may drop off with the underlying patch of scales) as the label is necessarily small, so as not to impede the flight of the butterfly in any way, to call attention to the fact that it is a marked individual I then paint some of the Fuchsin solution on to the wing; in the case of _V. atalanta_ or _V. cardui_, for example, the white spots at the tips of both forewings may be coloured magenta on both sides.

The small paper labels are best written up in sheets and cut off as required. When painting a number onto the wing of a White butterfly, any excess of colour on the brush results in blotching; should the number be blotchy, it can be repeated on another wing. When affixing a paper label with Canada Balsam, it is as well to have two pairs of forceps, one to hold the label and rub its lower side only over a very slight smear of balsam, the other forceps to press the label firmly onto the wing; if only one forceps is used, it is liable to get sticky from the balsam and to detach the label when trying to press the latter onto the wing.

Should any of our members come across any marked butterflies, I should be glad of a note of the species, its identification-number, and place and date where met with. Over 300 marked individuals have been released here this year up to date.

Should any members wish to start marking butterflies, I would suggest their communicating with me first, so that definite series of identification-marks may be alloted, to avoid any possible duplication.

It is hardly necessary to add that a Register should be kept of all butterflies marked, noting species, sex, condition or any individual peculiarities, place, date and time of release, and how marked.

One fact, clearly brought out by marking here, is that marked butterflies nearly all move off and are not seen again. Even in the case of the common White butterflies, very few (about one in a hundred) return to my garden. The proportion of marked individuals, which may be expected to be reported elsewhere is, of course, very, very small. But what is needed is exact information of the movements of individuals and this method [illegible] slight chance of obtaining this.

T. BAINBRIGGE FLETCHER.

Rodborough, Glos.
17th. June., 1937.

oOo

Just a reminder to members not to forget to fill up their phenological recording sheet (with April Bulletin) and cards connected with the recording of migrant insects.

**

We notice as the concluding paragraph to the S.E.U.S.S. Bulletin the following: "[illegible] representatives for the following Societies which have recently been affiliated: Barnet and District Natural History Society, Booth Museum (Brighton), the Royal Society for the Protection of Birds, and the Amateur Entomologists' Society."

We are sorry to recall that our organisation sent no representative to the Congress; no member of the Committee having been able to get away on the dates arranged. We hope this may not occur again at any time in the future.

**

RECEIVED: The following books have been received during the past month. They may be borrowed from B.A. Cooper by those members known to any of the Committee who are satisfied that the books will be safely returned. Postage in each direction must be paid by the borrower.

1. "CLASSIFIED ILLUSTRATIONS OF BUTTERFLIES" (Of the Japanese Empire) "IN THEIR ORIGINAL COLOUR" by Boku Yamakawa. 8th. Edition 1930, 48 coloured plates. 65 [illegible] in text. Generic and specific names in Latin type, numbers in Arabic numerals. Used by our member Fumikiko Yano, who also adds a key translation to localities and three additional plates. Valuable to anyone wishing to make exchanges with our Eastern members, and a sure incentive to the collection of non-British species.
2. TRANSACTIONS OF THE SOCIETY FOR BRITISH ENTOMOLOGY Vo. 4 Part 1 (30.4.37). "BRITISH SPECIES OF THE DACMISA (Hym., fam. Braconidae)" by C.E.J. Nixon, B.A. pp 89 pl. 22. By exchange.
3. JOURNAL OF THE SOCIETY FOR BRITISH ENTOMOLOGY, Vol 1, Bart 7. Various articles dealing with Lepidoptera, Coleoptera, Hymenoptera, and other orders. By exchange.

   The latter two volumes contain little of interest to beginners.
4. "BUTTERFLY TRAVELLERS" by C.B. Williams. Reprint from the National Geographic Magazine. May 1937. 10pp., 9 plates, 8 being coloured. Kindly sent by the author.
5. VARIOUS ITEMS DEALING WITH MIGRATION - from Captain T. Dannreuther.

B.A.C.

oOo

REPLIES TO QUERIES.

No. 26. Capt. T. Dannreuther, R.N., sends us the following:-

W.L. Rudland of 211, Caversham Road, Reading, the Berkshire County Recorder for Insect Immigrants, found a larva of the Silver Y moth, Plusia gamma, spinning up on mint on May 25th., 1937, and resting inside its cocoon. It turned to a pupa on May 27th from which a male imago emerged on June 9th. This implies the presence of an ovipositing female at Reading early in April, perhaps a month before any insect was recorded for some years past. In 1937, the phenological record for England was May 2nd near Barnstaple, and midnight, May 3rd/4th for Ireland near Tinoleague, Co. Cork. The finding of this single larva serves to illsutrate the saying that "absence of evidence is not necessarily evidence of absence".

No. 34. In 1918, while on leave from France, I found 3 doz. approx. very small S. pavonica larvae on Blackberry (Rubus fruticosus) near Brighton. Returning to London, the larvae were offered Rose (Rosa) as a substitute food plant. This they accepted. During my absence, they were kept in a round glass topped breeding cage, and eventually all spun up. The pupae hatched in due course and none were lost - a most successful hatch. The site where I found the larvae is now, alas, bricks and mortar.

MAJOR H. BLACKISTON, B.A.(Oxon.)
F.R.E.S.

No. 35. Strong carbolic acid is useless - try Glacial carbolic acid; no mould can then form. Any chemist will supply instructions as to how to melt the acid. In over 45 years experience I have never found naphthalene have any injurious effect or produced moisture. Some other cause may be found. As a "grease-killer" I have tried all methods with only temporary success. The method that lasts for many years is to plunge specimens in CARBON TETRACHLORIDE: in the case of H. humuli for about 4 hours. Larger moths in proportion. This is the agent used in patent fire-extinguishers; should be used with great care out of doors, as fumes are very harmful and can "knock out" the person who gets them in any quantity; alternately try out the "New Gas Mask", having previously insured life. Dry specimens in time-honoured way, i.e. "gentle breeze in window"!

Lastly, has house at CLEVEDON Damp Course?

MAJOR H. BLACKISTON, B.A.(Oxon.)
F.R.E.S.)

Since we are hoping in the near future to produce a reprint of all queries from our first Journal up to the present number, we hope that all members will look through their back numbers and send us replies to those still unanswered or additions to those partially answered.

***

Query No. 39. Is there any method known of successfully rearing larvae of the Footman (Lithosiidae)? I have obtained from time to time larvae of two or three species when nearly half-grown, but in every case the mortality has been very high, whether larvae were fed on lettuce or on their native algae or lichens. For example, the case of Nudaria mundana (Muslin Footman) is typical. Larvae collected from the undersides of limestone blocks on stone walls in Gloucestershire and Oxfordshire (my thanks are due to Mr. T. Bainbrigge Fletcher for his introduction to the mode of capture of the species), were fed on algae off tree-trunks (Pleurococcus) in a pill-box with no vent for aeration (this after having been warned that they would be too dry if kept otherwise). They progressed favourably till late May when mildew finished off the lot on the arrival of real warm, summery weather. Previously I had a suspicion that there may have been cannibalism present, but if so, it was very slight. It was noticeable that they fed and grew most after the food had been newly moistened.

B. A. C.

Query No. 40. Can anyone explain the strange violent jerking movements which one sees so commonly abouts ants of the Acanthomyops niger (Common Brown Garden Ant) species? The whole body is thrown backwards and forwards very quickly, whenever an ant meets another of the same colony.

A.N.B.

Query No. 41. Why is it that Leptothorax acervorum (Slender Ant), that small, delicate-looking ant which is found occasionally on heaths in the south of England, is so often found foraging round the nest in twos, where one always leads, and another one always trails carefully behind, exactly in the track of the first one. They literally touch "head to tail." If one should become "uncoupled," the first one will go to great pains to wait for the second to catch her up. Yet in captivity, I have never witnessed this phenomenon at all.

A.N.B.

oOo

WANTS AND EXCHANGES.

B.G. Leonard (no. 96) has for exchange larvae of Puss (D. vinula), Emperor (S. pavonia) and Privet Hawk Moths (S. ligustri).

B.G. Abell (no. 76) has for exchange larvae of Lime Hawk (D. tiliae), Emperor (S. pavonia), and Muslin Tiger Moth (D. mendica.)

B. A. Cooper (no. 19) has for exchange larvae of Waved Umber (Hemerophila abruptaria) and a few of this species ab. brunneata X typical form. Also Smerinthus ocellatus (Eyed Hawk) larvae.

oOo

MEMBERSHIP CHANGES.

Newcomers:-

No. 92M John M. Smithells, 37, George Road, Bushey, Herts. (Lepidoptera, moths only.)
No. 93 A. Ford, 42, Irving Road, Bournemouth, Hants. (Coleoptera, Lepidoptera.)
No. 94 J.E. Knight, Toptrees, Woodside Avenue, London, N.12. (Lepidoptera,)
No. 95 [illegible].K. Venner, Gosfield Vicarage, Halstead, Essex. (Lepidoptera.)
No. 96 B.G. Leonard, 29, Stoneton Road, Oxton, Birkenhead. (Lepidoptera.)

Change of Address:-

No. [illegible] A.N. Brangham, to 1c, Howitt Road, London, N.W. 3.

Present Total: 98.

oOo

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

VOL. 2 NO. 20 PRICE SIXPENCE SEPTEMBER 1937

PRESENTED

CONTENTS.

TITLE	AUTHOR	PAGE
Editorial	Eds.	81
Letter	S.G. Abell	82
Reply to S.G. Abell's Letter	Eds.	82
The Common Earwig	A.J. Musgrave	82
Migration Notes	Capt. T. Dannreuther	83
Calendar	B.A.C.	84
Reply to Query 34	B.G. Leonard	86
	G. Burt	86
	H.G. Morgan	86
Reply to Query 38	B.A.C.	86
Query No. 42	H.G. Morgan	86
43	B.A.C.	87
44	W.N. Roberts	87
Wants and Exchanges	Henry G. Morgan	87
Books Received		87
Membership Changes	B.A.C.	88
		89
Brimstone Butterfly Larval Habits	E.T. Daniels	89

Bulletin No. 21 will appear early in October. All contributions must be received by September 20th. Members are specially asked to endeavour to reply to unanswered or only partially answered Queries from back Journals, so that these may be included in the Reprint.

COMMITTEE

BRITISH MUSEUM (NAT. HIST.) DEPARTMENT OF ENTOMOLOGY

HON. SECRETARY & EDITOR:
(to whom all matter for the Bulletin should be sent):
B.A. COOPER
61, Okehampton Road,
London, N.W.10.

ON. ASSISTANT SECRETARY (to whom to
pply if further Bulletins required)
[illegible]
8, Hurst Road,
Bexley,
Kent.

HON. EDITOR &
ADVERTISING SECRETARY:
A.N. BRANGHAM,
1c, Howitt Road,
London, N.W.3.
(Telephone: PRImrose 6073)

Published by the Society in London.

THE ENTOMOLOGISTS' BULLETIN

is published nine times per year by the

AMATEUR ENTOMOLOGISTS' SOCIETY

The minimum annual subscription to the Society, including the year's Bulletins, is:-

Great Britain, Empire & U.S.A. ...	3/6 post free
Other Countries...	5/- post free

This should be sent to the Hon. Treasurer, B.A. Cooper, at 61, Okehampton Road, London, N.W.10. Postal Orders may be made payable at Kensal Rise, N.W.10. Branch Office. The subscription of those joining later in the year than September 1st. covers the period till the end of the year in addition to that of the following year. Back numbers are obtainable at two thirds the published price.

Authors desiring "extras" (reprints of their article alone) may obtain them by ordering at the time of sending in the contribution at the following rates: First twenty ninepence, each succeeding twenty threepence per double side of printing. Typing appears as in the Bulletin, other matter on the same page being omitted.

The Hon. Secretaries will be pleased to forward a specimen copy of the Society's Journal and a prospectus to any non-member likely to be interested, on receipt of name and address. They will also gladly send prospectuses to those members who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage. If contributors desire return of their MSS after publication, would they please mention this when writing, and also enclose the required postage stamp. We are able to reproduce SIMPLE drawings and diagrams if authors send us a facsimilie drawn in Indian ink at the size they wish the reproduction (which must not exceed 7 ins. X 11 ins. in area) to appear.

The exchange column is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting for many years are advised to confine themselves to the exchange of ideas, apparatus, and live insects, leaving that of set, pinned and unpinned specimens till they have had more experience.

The Editors offer no guarantee for any articles offered in the Exhhange column, and they are in no way to be held responsible should the privilege allowed be abused. Unless members state to the contrary, exchange notices will be inserted in the Bulletin once only. For addresses, please refer to the membership list and subsequent membership changes list.

Anyone at present not recording migrant lepidoptera and dates of first noting the species on the phenological list each year, who would care to note down and report anything connected with those subjects that he might observe, should write to B.A. Cooper or C.H. Veale for free literature and information. Any further information in migration will be willingly given by Cappain T. Dannreuther, Windycroft, Hastings, and on Phenological Recording by Major H.C. Gunton, Rathgor, Gerrards Cross, Bucks.

Books mentioned under the heading "Received" may be borrowed from B.A. Cooper, borrower paying postage both ways.

If there are any members living abroad or in the provinces, who are in the unfortunate position of not always being able to get the book they desire, we shall be glad to order it for them, postage being additional to the published price.

THE AMATEUR ENTOMOLOGISTS' SOCIETY although of interest to all amateur collectors, sets out to assist in every possible way the less advanced collector and student of entomology. Beginners are especially welcome. If not satisfied with the Bulletin, write to the Editors

ADVERTISERS' ANNOUNCEMENTS.

This page is reserved for members' advertisements (not exchanges), dealers' [illegible] notes. For advertising rates, apply to the ADVERTISING [illegible] A.N. B[illegible], 1a, [illegible] ROAD, BELSIZE PARK, LONDON, N.W.3. (Telephone number PRimrose 6073). Advertising 'copy' should be sent to Mr. Brangham by the 20th. of the month before the next issue of the Bulletin is published.

H.K. LEWIS & Co. Ltd.
PUBLISHERS & BOOKSELLERS.

SCIENTIFIC BOOKS

ENGLISH and FOREIGN books on the Biological Sciences can be supplied from stock, or obtained prompty to order.

CATALOGUES are issued, and will be sent post free on request.

SECONDHAND BOOKS in all branches of science are available at the Secondhand Department, 140, Gower Street. Catalogues and quotations on application.

LENDING LIBRARY

The Scientific Library lends books on the pure and applied sciences.

THE ANNUAL SUBSCRIPTION is from one guinea.

BOOKS may be retained as long, or exchanged as often as desired. New books and new editions are added as soon as published.

DETAILED PROSPECTUS will be sent post free on application.

H. K. LEWIS & CO. LTD. 136 GOWER STREET,
LONDON. W.C.1.

DUPLICATING - Have your duplicate and desiderata lists duplicated by the Society. Rate: First hundred like sheets 2/6d, each succeeding hundred 1/[illegible] Profits to the Duplicator Fund. Only clean, well duplicated pages produced.
PRINTING - Name and locality labels, any wording, in finest type (6 point Cheltenham or Cheltenham bold), 2/6d per 250 alike, 6/- per 1000. Saves much time in label writing, and is far neater in the bargain.
BINDERS - For the Entomologists' Bulletin. Spring Back. Keeps Bulletins flat and protects them from dust or careless handling. Price 2/9, post free.

A reprint of all the more important articles from Volume 1 of this Journal is now being produced. Between thirty and forty pages long, it will cost 2/-. Contains many useful hints and suggestions for collectors. As only a limited number of copies are being produced, make sure of yours by booking early.

Let the Society benefit from your wants in these directions. Obtainable from B.A. Cooper.

You can ALWAYS obtain
OVA, LARVAE,
PUPAE,
& SET SPECIMENS
of British & Foreign Lepidoptera
Dogs, Birds, Bees, Honey,
Cavies, Cigarette Cards and Books (all subjects)
From:
"THE BALLINGER BUTTERFLY AND BREEDING FARM"
Head Office: "The Cottage", Canham Road, London, W.3.
Phone: ACOrn 3234.
Lists Free.
Discount given to members of the A.E.S. quoting their membership number.

oOo

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY.

Vol. 2 No. 20 September 1937

Dear Fellow Members,

We are glad to report that these holidays have brought about many meetings between our members. For ourselves we have been horrified in more than one instance, by both bad setting and bad labelling of specimens. The former item is dealt with elsewhere in this month's Bulletin,*and owing to its exceeding importance, we propose to devote this editorial to the discussion of labels - their form and uses. (* Held over till next issue.)

In the first place, every specimen should carry a label bearing at least date and place of capture. For temporary specimens, retained only until a more perfect series is obtained, this is not essential, but for any specimen destined for a long life, whether in ones own collection, or for exchange, this precaution is absolutely essential. Many collectors add their own name, while further particulars may be briefly inserted without making the label unduly large. Abbreviations are very commonly used, thus:"S" - meaning "at sugar", "L" - "larva ta ken at"; "LT" - "at light"; "SL" - "at sallow blossom", and so on. With regard to place names, localities rarely visited usually are followed by the name of county, nearest town, or guide to their discovery. This ought always to be written, but in view of time taken in hand-writing labels, this is perhaps excusable; when having labels printed, however, this point should not be forgotten. Abbreviations such as W - woods, H - heath, C or COM - common, are also often used and need no key in order to be understood. When the locality of origin is unknown, it is usual to state: "BRED: EM 15.8.37" or: "EX. TESCH COLLECTION".

One member (he will excuse us if we mention no names!) did not label his specimens at all. This is the one unforgivable crime in entomology, with the possible exception of over-collecting and possible extermination. A specimen may be defaced in setting, or badly set - this is bad luck, or lack of skill, but not even the excuse of lack of time will clear the character of one guilty of leaving the specimen permenantly unlabelled.

Other members (here we feel weare running into controversy) number their specimens, the required information being obtainable from a card index, file, or note-book. There is much to be said for these methods as time saving and simple, but, for the private collection, they should be avoided because of the possibility the cards or files one day, on the death of the owner or otherwise, becoming separated from the parent insects. When one wishes to exchange a specimen a new label must be written out for it, or no exchange can be made. Discardedsspecimens leave blanks in the table which are not always easy to fill in. In a card index with a card per species, unknown specimens have to be renumbered when they are correctly identified.

One difficulty met with when giving full information on the label affixed to the pin is that of secret localities. Some mention vaguely the county of origin, while others design queer hieroglyphics or initials decipherable only from a note-book. Perhaps it is as well in such cases that the clue-bearing note-book should be conveniently lost when the collection is dispersed!

To conclude, it is unnecessary to state that labels should be as small and inconspicuous as possible. Even in cases where only date has to be filled in on the label, time may make it necessary only to label the first of a day's catch, the others being placed with it, and dealt with during the winter. Much information, such as time of day, weather, or peculiarity of capture is unnecessary, or, if considered such, may be entered under species heading in a notebook, this, if of any value at all, being an attribute of species rather than specimen. A number may be added as well, if anything of more than passing interest is to be recorded in the diary or notebook (always an accessory and never an alternative to the label). Sex and species are redundant, as these are usuall determinable from the specimen. Where confusion is inevitable, e.g. Grey Daggers (*Acronycta tridens* and *psi*), the species name should be placed on a separate label above or below the orthodox type. The monetary value of a specimen is greatly increased by careful labelling; unlabelled specimens are almost valueles We have now made arrangements with [illegible] who produces excellent data labels, for which, see the Advertisers' Announcements page.

7th, May, 1937.

Dear Sirs,

May I congratulate you both on the high standard you have achieved and maintained in recent issues of the " Bulletin " ? I was rather startled to find that our exellent paper works out at $4\frac{2}{3}$d per copy including postage! Surely, Sirs, you cannot find such a price remunerative? I doubt if it even covers bare costs!

I feel sure that no member of our Society would like to think that our two enthusiastic Editors were hampered for lack of funds; and yet that must be the case with the " Bulletin " at its present price.

I know that a number of members have sent donations but I feel certain that all members would wish to do their bit in making the necessary finance of the " Bulletin " certain.

May I suggest that the subscription for Senior members be raised to 5/- per annum? It would be to the mutual advantage of Editors and members and a small mark of appreciation of good work ungrudgingly performed.

Yours etc.,

S.G. ABELL.

Much as we appreciate Mr. Abells suggestion, may we repeat our former argument for not raising the subscription further - namely, that in doing so we may possibly cause some of our less fortunate members or those whose interest is at present rather luke-warm to drop out of the Society. To be sure, the 3/6 subscription DOES barely cover the costs, leaving little over for those large items, postage and advertising, very necessary for our continued existence. As a matter of fact we had been considering the addition of a further sixpence to the subscription, possibly also with the production of a tenth Bulletin each year. Perhaps members will let us know their views on this subject. Probably owing to the holiday season, replies to recent advertisements have been very few indeed, but of these the proportion joining has been very encouraging. It should be remebered that the larger our membership, the more likely are exchange notices to bring good replies, and the more varied our choice of articles for the Bulletin. EDITORS.

oOo

THE COMMON EARWIG.

The earwigs form a very uniform group of insects which are nowadays all classed in the order Dermaptera. In the past they have been placed in the order Coleoptera and the order Orthoptera (cockroachs and crickets). In his monograph "British Orthoptera", Lucas mentions seven species of earwig as occurring in Britain but some of these are very rare.

The Common Earwig, the European Earwig, as the Americans call it, or Forficula auricularia as it is called by the systematist is by far the commonest British earwig. It is too common an insect to need any description: The presence of wings in the adult , the 14-15 antennae segments, and the presence of abdominal scent folds are some of the classificatory characters of the species.

Despite its commoness and its uninteresting appearance, the earwig has [illegible] interest for anyone worthy of the name Entomologist , and for the Etymologist too; For no one knows why it is called earwig and similar names containing "ear" occur in other languages.

The first thing one notices about the earwig is that it can run, the second that it has nippers or callipers at its posterior end. The nippers of the male are curved, leaving a big gap; those of the female are almost straight leaving no gap. The nippers appear to have a defensive function, but there is reason to believe that they help the insect to refold its wings. Although the common earwig has wings it is very rarely seen in flight. Probably the last thing one notices about Forficula auricularia is that it flies! The wings are folded up underneath the two little flaps on the earwig's back. The little flaps are called tegmina and are really the front pair of wings. If you can unravel the delicate membranous hind wings without tearing them you can feel proud of yourself.

It is most probable that earwigs pair in the late autumn. The eggs are laid in late winter or early spring in little pits in the soil or underneath bark or under stones. The average number laid is about 20. The mother earwig looks after the eggs with great care. (I have had them lay in captivity.) She cleans them and picks them up, and, to a certain extent, protects them from intruders. Most of the time she stands over them, Usually if the nest is broken up, she makes an effort to collect the eggs together again. When the young hatch they are nymphs, not caterpillars (the earwigs have no pupal stage). The mother looks after the young nymphs and there is evidence forthinking that she feeds them from her own mouth. The nymphs are adult by the end of the summer but before then the previous generation has died off. There is still much that is not known about the family life of Forficula auricularia.

A nocturnal insect, the earwig is often to be seen visiting the lepidopterist's sugar; it is an omnivorous creature, and it is doubtful to what extent it is a pest in Britain. In the United States it is certainly regarded as a pest and measures are taken against it.

Forficula auricularia is quite harmless to man; it cannot bite or sting. If you get one in your ear, the remedy is olive oil.

Not the least interesting thing about Forficula auricularia is the number and kind of its parasites. Two fungi attack it under damp conditions. It has a protogoal parasite in the gut - Clepsydrina ovata. Earwigs are said to be parasitized by a parasite worm called a Gorctrid. I have found numerous earwigs parasitized by a Nematode worm (eel-worm). This eel-worm is found in the abdominal cavity. One earwig I dissected contained an eel-worm 3 inches long and had complete ovaries and gut. The latter contained Clepsydrina.

In addition to these, the earwif is parasitized by two flies both of the family Tachinidae. These flies are parasitic in the earwig in their larval stage; the adult flies being free living. Both these Tachinid parasites are themselves parasitized by other insects. In addititon, the earwig is eaten by bats, starlings, chickens, toads, and frogs.

In conclusion, I hope that by this short article, I have stirred up some interest among amateur Entomolggists in the interesting little insect, Forficula auricularia, about which there is still much to be discovered.

BIBLIOGRAPHY.

1920. Lucas : British Orthoptera. Ray Society Monographs.
1924. Fulton, B.B. Some habits of Earwigs. Ann. Ent. Soc. Amer. 17 pp 357 - 367.
1914. Brindley, H.H. Proc. Camb. Phil. Soc. Notes on certain parasites, etc., of the common earwig.

Entomology Dept.,
Imperial College of Science,
London, S.W.7.

A.J. MUSGRAVE, B.Sc.

oOo

MIGRATION NOTES.

Captain T. Dannreuther writes: "With reference to the immigration of many thousands of Pieris brassicae (Large White) with one tenth of P. rapae (Small White) landing on the north Norfolk coast from Mundesley to Burnham Market at the end of May to June 7th., we want records of gardens attacked by their larvae which should occur now in the Soke of Peterborough province. Eastern Evening News of July 17th. reports a plague of caterpillars of P. brassicae with parasites attacking them in a field of brown mustard at Terrington St. Clement, 4 miles west of King's Lynn - now being watched by Mr. R. Petherbridge, the Advisory Entomologist from Cambridge. The immigration is reported in the Entomologist for July and August in detail.

'After relative absence, Plusia gamma (Silver Y) appeared again in the Covered Parade at Hastings at lights on July 16th. - 170 P. gamma and 50 T. pronuba (Large Yellow Underwing) were counted by H.G. MacLeod. Numbers are much smaller than last year at this period, 20,000 Vanessa atalanta (Red Admiral) were reported at Brighton on June 5th., p.m., and all had gone by June 8th., a.m. Where to?'

Most migrants are about this year but, in London at any rate, they are not on the whole as common as last year. We hope to give before long a brief account of the season's records so that members may be able to see how their own observations (which they should send in as early as possible) compare with those of other observers elsewhere.

oOo

CALENDAR.

In this month's notes I propose to deal with hibernation of larvae - a topic which many members will no doubt find of some value.

METHOD I : The first general method is to sleeve out exposed to all weather on the foodplant, which will be available for feeding when they awaken in spring. Some species nibble the stems all through the winter or may be sleeved on an evergreen plant or shrub.

METHOD II ; The second general method is to fill an outdoor breeding cage with a fairly thick layer of dead leaves, food, if any, being placed in moist earth or sand. The box may also be filled with peat or moss into which many species burrow in cold weather. Sliced carrot, turnip, parsnip, swede, mangold, beet or potato, are the best food for Hepialid and subterranean Noctuid larvae, this keeping fresh for long periods in moist earth or sand. Needless to say, slugs and woodlice should be removed when seen.

Purple Emperor (Aptura iris) and White Admiral (Limenitis camilla) should be sleeved on foodplant, or better, left open and exposed, resleeving when they recommence to feed in the spring.

The Silver-Washed Fritillary (A. paphia) hibernates after having eaten its egg-shell and a leaf or two of Dog Violet (Viola canina) . The unhatched ova should be placed ina glass-topped tin with a few dry violet leaves and left till the end of February in a cool place, such as on the stone floor of a cellar. The young larvae will be found to have hibernated without loss; and may then be awakened by placing the tin in the sun; they should be sleeved, then, on a pot of growing violets in a sunny position protected from the weather.

The High Brown Fritillary (A. adippe) lays its eggs in July and these do not as a rule hatch until the following March or early April. The larvae, however, are fully formed soon after the egg is laid, and will die unless kept moist during the winter. The eggs should be laid between two wads of moss and kept out of doors exposed to all weather except the sun till the end of February, when they should be sleeved on the growing foodplant. Both this and the previous species may occasionally produce imagines the same year as the eggs are laid.

The Dark Green Fritillary (Argynnis aglaia) should be sleeved on growing violet, the plants being covered with about three inches of dead leaves mixed with moss. Fine mesh muslin must be used till the larvae are hibernating, but this should be substituted as early as possible for open mesh material to allow plenty of air to circulate during the winter. The fine mesh sleeving should be replaced about the first week in March. This method should also be used with the other hibernating Fritillaries of the genus Melitaea. It is recommended that the violet, narrow leaf plantain, etc., should be planted in a large tub or very large flower pot, to facilitate sleeving.

The Skippers and Blues also hibernate in the same manner and should be treated likewise. The Browns (Satyrinae) should all be sleeved on pots of growing grass and exposed to all weather. This also applies to grass-feeding Noctuidae, Geometridae (which should be supplied with moss and dead leaves for hiding in) and the Drinker Moth (O. pototaria). M. galatea (Marbled White) hibernates when very small, but recommences to feed about mid-December. Treat as for the Silver-Washed Fritillary, placing out of doors in December.

It should be remembered that the genus Colias does not hibernate naturally in Britain's cool climate, and every effort should be made to bring them through the same year. G. Burt mentions that some ova he obtained from Colias croceus (Clouded Yellow) which hatched on September the 24th 1936 commenced pupation on November 6th. When next the box, which had been kept in the warm, was examined, on December 3rd., they were found to have all emerged and ruined themselves. Let this be a warning to others!

South gives the following advice, page 50, on rearing Colias hyale (Pale Clouded Yellow): "In rearing this species from eggs laid in the autumn, a fairly dry treatment appears to be the best. Protect the young caterpillars from frost, and do not water the plants during the winter. When they become active again, about February, transfer them to other growing plants, which should be kept ready for the change. Do not water the plants much or wet the foliage at all, and keep a sharp look-out for earwigs"

The Tussocks (*Lymantriidae*) go into hibernation early, each in a silken cocoon. They must be kept cool, but may be protected from the weather in outhouse or outdoor breeding cage. The one fault to guard against is that of their becoming too dry. Heavy rain or sodden sleeves may kill a web of *P. chrysorrhoea* (Brown Tail) during the winter.

Eggars (*L. quercus* and its var. *callunae*) should be sleeved exposed to all weather on an evergreen such as heather, ivy, or *Euonymus japonica*. It is of help to give them leaves to hid in during cold spells. I have hibernated them successfully indoors, but they should never be brought into the warm.

The Fox (*Macrothylacia rubi*) should likewise be exposed to all weather. A perforated zinc breeding cage should be used, the base being planted with heather, peat moss, or earth for the larvae to bury themselves in during bad weather. Conditions as natural as possible should be obtained and mortality will be relatively low. (See replies to query 23: E.B. 13 p. 7, 14 p. 12).

The Lappet (*Gastropacha quercifolia*) should be sleeved on its foodplant in a fairly large sleeve not more than a few feet above the ground, the lower the better. They should not be disturbed till late March, when they have reawakened. Leave all dead leaves, frass, etc. in the sleeve untouched and very few will be lost.

Nolidae should be given bark to hide in during the winter, and should be kept in a cool place, preferably out of doors.

Phragmatobia fuliginosa (Ruby Tiger), like the Fox Moth, is full fed in autumn and should be treated likewise, i.e., exposed to all weather, and with leaves to hide in.

Parasemia plantaginis (Wood Tiger) should be treated similarly, but seem to prefer peat or moss to burrow in. They feed up the following April and May. *Diacrisia Sanio* (Clouded Buff) is another with the same habits, which, however, it is usually not difficult to make to produce a second brood in the autumn, a wise precaution in view od the difficulty of hibernating the species.

Arctia caia (Garden Tiger), *C. dominula* (Scarlet Tiger), *C. hera* (Jersey Tiger), and *A. villica* (Cream Spot Tiger) should be kept in a shady place protected overhead from undue moisture. A liberal supply of dead leaves and occasional food for the last three and losses should be few even in cold districts. In March they should be brought into the sun and food supplied more frequently. The same treatment should also be sufficient for *Coscinia cribrum* (Speckled Footman), but I know of noone who has troubled to hibernate this species. If any member has done so, I should be glad to hear from him.

Lithosiids (Footmen) should be hibernated wherever possible out of doors. Lichens or algae should be supplied occasionally, but they will also nibble lettuce, dandelion, and withered leaves of sallow, slow, and plum. Moisture is essential for all species. Many also are bad cannibals, even of their own species.

Most Noctuidae may be hibernated indoors, but even so, few should be brought into too warm an atmosphere. Chickweed, dock, dandelion, and stems of birch, sallow, etc. may be supplied regularly, but most find dock sufficient. Agrotids and one or two others should be given sliced carrot, turnip, mangold, beet or potato in moist earth or a saucer. This is very good also for Hepialid larvae.

Geometers usually survive best when sleeved outnof doors, and then should not be touched (as with the Emeralds). The *Boarmias* (Beauties) nibble stems and buds throughout the winter, and are quite satisfactorily hibernated in a cool shed. Privet feeders I have kept in the warm all through the winter and suffered no loss. Small species such as the Waves (*Acidalia* spp.) are best kept in flower pots with moss and dead leaves.

If larvae of unknown species are taken, deal with them in as natural a manner as possible. If they should spin up and not hibernate, they will come to no harm if given a wet rag or handful or two of bulb fibre in the bottom of the sleeve in which they are placed. A very few species require wood or sand to pupate in, but will generally spin up successfully in a sleeve thus supplied.

B.A.C.

oOo

REPLIES TO QUERIES.

No. 34. B.G. Leonard suggests that hawthorn is a better food for Saturnia pavonia (Emperor) larvae than bramble, and that this may account for their decrease. He has reared them in large numbers for three years on hawthorn, and has had hardly any deaths to account for.

This year I received about 35 larvae from Mr. Abell, the descendants of last year's ill-fated sextet. All were sleeved on apple and later sloe, which they appeared to relish, being placed on the shady side of a hedge. About June 17th., when entering the last instar, and during a period of overcast, wet and thundery weather, they turned black and developed "flop" apparently due to bacterial or fungoid invasion. Owing to the wet and lack of time, they had been left for about a day untouched after they had consumed their earlier rations, but starvation could not have been a primary cause in their disappearance. Being very busy at the time, I was unable to ascertain the real cause of death by microscopical examination; certain it is, from the number and condition of the corpses that there was no cannibalism among the brood. A large number of Lime Hawk larvae, (D. tiliae) also suffered heavy mortality during the same storms, being amply supplied with food and an airy sleeve. I am inclined therefore to suspect the heavy rains of having done the damage in this case. B.A.C.

Last year I bred Saturnia pavonia from the egg. Of twelve eggs which hatched, one died in the first moult, the other eleven surviving till the last instar. When almost fully fed, six of them turned deep green and then blackened, became limp and died. The remaining five pupated normally, and have since emerged. I also found one larva at Studland, Dorset, in late August of last year, whose movements were sluggish, and which soon turned deep green, limp, and died, like the others. Although dissected, no trace of parasites was found.

I had a similar experience with Endromis versicolor (Kentish Glory) this year, except that in this case the larvae died while still young. They appeared to have been attacked by an infectious disease, possibly of a bacterial nature, possibly similar to the above case. HENRY G. MORGAN (90).

While not absolutely on the subject of this query, it may not be inappropriate to record here loss of S. pavonia pupae during the winter through mildew. Each year for the past four years I have had a few pupae collected as larvae on the moors near Whitby, Yorks, and Barmouth and Penmaenmawr, North Wales, and I have not had a single emergence, death in every case being due, where not traceable to parasitism, to a mildew. I have kept them moist (as on the moors) and dry, indoors and out of doors, exposed to the weather, ineach case with the same result. This year I obtained my first emergence out of fifteen pupae obtained from over sixty larvae collected last year on the Whitby Moors, the remainder being parasited. They were stored through the winter in a dark shoe box, but this, of course, would allow a damp atmosphere, kept as it was in a cool place indoors. Northern Eggars (Lasiocampa quercus var. callunae) on the other hand, obtained at the same time, together with some sent by Mr. Kennedy (No. 20), failed to emerge through their drying up, although Ophion parasites managed to emerge successfully from the "dead" cocoons. B.A.C.

In 1936 I bought some ova of this species and bred them on hawthorn. When nearly full grown all excepting one died, gradually becoming stiffer. On dissection a thick layer of fatty substance was found under the skin, and this contained, generally, two worm-like animals, about 1/16 inch by 2 to 3 inches coiled right along the body. The rest of the caterpillar consisted of a reddish-brown fluid with particles of the same colour. One managed to spin a small cocoon and pupate, but soon dried up.

This year I received three pupae from Mr. Kennedy (No. 20), 2 males and a female emerged. The male I took to the heaths near Dorchester, and assembled males to her, one of which paired. First I fed the caterpillars on hawthorn but on placing them in a large cage with some Pussas (D. vinula) feeding on willow I found they prefered the willow so I gave them it instead. Between 20 and 30 pupated successfully at the end of July. G. BURT.

No. 38. The best method I have found of relaxing old papered insects is to use methyl alcohol. Commercial wood naphtha is quite efficient, though very poisonous - death, I am optimistically informed by a book on this subject, is usually preceded by blindness! If the alcohol is applied to the thorax with a paint brush or fountain pen filler (pipette), the body becomes soft after five minutes. The insect can then be set in the usual way, although it is preferableto do so on a board whose sides slope downwards, since there is a slight tendency for the wings to spring back towards the vertical. The alcohol rapidly evaporates, leaving the insect stiff, and setting is complete after a day. If the board is left in a warm place, it is safe to take the insects off after only twelve hours or even less. HENRY G. MORGAN (90).

oOo

QUERIES.

No. 42. Are there any satisfactory methods of keeping ants, woodlice, and slugs out of outdoor ground-level breeding cages? Pupating larvae and pupae are often molested ,and great damage done by these organisms, yet the laying of rings of noxious fumigants on the ground roundabout is liable to bring failure in the shape of deformed imagines. The breeding cages have their bases several inches below ground level to conserve moisture, and most are fitted with perforated zinc bottoms so that foodplants may produce roots deep enough for them to be able to survive after periodical invasion by my larvae. B.A.C.

No. 43. W.N. Roberts asks what advatages convex setting boards possess over flat boards, or vice versa. No doubt everyone wishes his collection to be uniform, and may have difficulty in deciding which type to make or purchase in quantity. For those who make their own boards the flat type is the only one feasible with any degree of perfection, and for this reason alone, this type would appear to have the advatage. We hope supporters of both types will put forward the pros and cons of their respective cases, or tell us some of the reasons for their present adoption.

No. 44. In the correspondence column of "Zoo" for May 1937, there is a letter in which a correspondent notes that silkworm larvae pupated in pairs, which produced a male and a female moth in each pair.

It has occurred to me that in the case of *D. vinula* (Puss Moth), and other moths which often lay their eggs in pairs, that the adults resulting from these eggs might prove to be male and female also.

The only case that I have been able to observe, that of two eggs of *C. elpenor* (Elephant Hawk), gave a negative result, both moths being females, but a single case like this is unsatisfactory.

If notes were made of observations on large numbers of pairs of eggs, and the results divided into two groups, according to whether the adults were both of the same sex, or of different sexes, the average results should show whether there is anything in the idea, If there is not, then the "sexes similar" group should be about equal in number to the "sexes different" group. Otherwise, the "sexes different" group should form at least 66% of the whole.

If any members would like to join in this investigation, I should be glad to hear from them, although it is now too late this year to give special attention to *D. vinula*. HENRY G. MORGAN (90).

oOo

WANTS AND EXCHANGES.

A.L. Capener (No.6.) asks if any members would like such things as ant-lions, mantis egg capsules, etc. He cannot promise to send them, but will bear it in mind if any come to his notice. He hopes to be able to collect seriously once more when summer arrives, (October - March).

Wanted in numbers - *Pieris brassicae* (Large White), *Agriotes lineatus* (Common Wire-worm Beetle), and many other species of economic interest, and also pupae. Offered in exchange many local species of Lepidoptera and Coleoptera from the New Forest. A. Ford (No. 93).

B.G. Leonard (No. 96) has the following pupae for exchange: Privet Hawk (*S. ligustri*), Poplar Hawk (*A. populi*), Eyed Hawk (*S. ocellatus*), Puss Moth (*D. vinula*), and also a few small larvae of the Lappet Moth (*G. quercifolia*).

J.H. Fox (No. 105) has for exchange pupae of Sphingidae; larvae of Lappet (*G. quercifolia*), Oak Eggar (*L. quercus*), and Scarlet Tiger (*C. dominula*): ova of Canary-Shouldered Thorn (*E. alniaria*), and Pale Oak Eggar (*T. crataegi*).

WANTS AND EXCHANGES (Cont:)

Wanted: pupae of Pale Brindled Beauty (*P. pedaria*); larvae of Jersey Tiger (*C. quadripunctata*), Dark Tussock (*D. fascelina*), Cream Spot Tiger (*A. villica*) and others of special interest during the winter.

S.C. Wincott (No. 106) has for exchange set specimens of *B. mori* and *P. rapae*, and eggs of *B. mori* and of stick insects. He is in need of pupae or set specimens of *P. brassicae* or pupae of Continental species, of both butterflies and moths.

A. N. Brangham (No. 18) has for exchange either living colonies or set specimens of the following British Ants:- *Leptothorax acervorum*, *L. nylanderi*, *Formica pratensis*, *F. exsecta*, *Formica fusca* var. *glebaria*, *Acanthomyops fuliginosus*, *A. mixtus*, *Tetramorium caespitum*. He would like in exchange living colonies or set specimens of the following British Ants:- *Ponera coarctata*, *Myrmecina graminicola*, *Solenopsis fugax*, *Anergates atratulus*, *Leptothorax tuberum*, *L. interruptus*, *Acanthomyops brunneus*, *Formica picea*, *Formica rufibarbis*, *F. rufa* var. *alpina*, *F. fusca* var. *rubescens*. He would be particularly glad to receive any specimens of ants captured in Scotland and Ireland.

oOo

BOOKS RECEIVED.

1. Butterfly Migration in the Tropics - text (8pp) by Dr. C.B. Williams. 5 coloured plates. British Museum (Natural History), price ninepence. A concise account of migrant butterflies, the more common species in different parts of the world being shown in accurately coloured plates. A worthy companion to "British Immigrant Butterflies and Moths", issued in 1935 by the same Authorities.
2. *Papilio Machaon*, Linn 1758, in Gloucestershire by T. Bainbrigge Fletcher (A separate from the Cotteswold Nat. F.C. vol. xxvi, pt. 1, 1936, pp. 91 -92). An interesting summary and discussion of the occurrence of the Swallowtail Butterfly in Gloucestershire. Sent us by the author.
3. Fabre's Book of Insects - by Mrs. Rodolph Stawell. Fabre's observations retold in brief and simple manner. For anyone who has not yet sampled Fabre's works this little book will open up a new world of painstaking observation and careful study in days when this was an unheard of luxury in natural history. The rewritten accounts banish some of the tediousness which is apt to appear in parts of this "Poet of Science's" writings without losing any of its logical rendering. However, as this book only contains but a selection of his works, we still have to read the original translations in the other cases and the slight modification in style should not be difficult to observe. Many a schoolboy enthusiast has been spurred on to greater interest in all kinds of insect life through the reading of Fabre's works and we hope our members will do likewise. Published by Thomas Nelson & Sons, 1/6, pp. 192. Given by A.N. Brangham.
4. The Natural History of British Butterflies by Edward Newman, F.L.S., F.Z.S. London, W.H. Allen & Co., 1885. pp. 176, xvi. A former standard work on British Butterflies, worthy of a place in every lepidopterist's library. Copies usually obtainable cheaply in second hand bookshops. The life-history accounts and distribution are very useful. Given by A.N. Brangham.
5. Common British Beetles and Spiders and How to Identify Them, by S.N. Sedgwick, M.A. London, The Epworth Press, 1918, pp. 62. An introduction to the collection of Coleoptera. Given by A.N. Brangham.
6. Insects of the British Woodlands by R. Neil Chrystal, M.A., D.Sc. pp. 337, xiii. Frederick Warne & Co. Ltd., 1937. 205 illustrations. A very useful book for those interested in the pests of woodlands and forest trees. The more important insects of economic importance are dealt with under the branches:- distribution, biology (life history), forest relations, natural enemies, and control measures in cases of outbreak. Given by A.N. Brangham.
7. Economic Advisory Council Committee's Report on Education and Supply of Biologists. H.M.S.O. 1932, 1/-. pp. 68. Very little of the matter contained herein is out of date, and it is very valuable to anyone proposing to seek a livelihood in this subject. Given by A.N. Brangham.
8. Chapter from Everyday Doings of Insects by Evelyn Cheesman, F.E.S., F.Z.S, George G. Harrap & CO, London, 1924. Popular essays dealing with interesting facts about insect life. Given by A.N. Brangham.

B.A.C.

MEMBERSHIP CHANGES FOR SEPTEMBER.

New Members:

No. 97 M - A.J. Duke, 25, Ravenscraig Road, Greenpoint, Cape Town, Union of South Africa. Cape Lepidoptera.

No. 98 M - D.O. Dykes, Ottinge Court Farm, Elham, near Canterbury, Kent.

No. 99 - R. Hilliard, 5, Oakleigh Gardens, Edgware, Middlesex. Lepidoptera, Coleoptera.

No. 100 - B.J. Leader, B.A., Rosemerrin, Bude, Cornwall. Lepidoptera, Butterflies only.

No. 101 - The Booth Museum, Dyke Road, Brighton 5, Sussex.

No. 102 - P. Walden, 79, Livingstone Road, Hove 3, Sussex. Lepidoptera.

No. 103 - Dr. J.V. Banner, Wykehurst, Varndean Gardens, Brighton 6, Sussex. Lepidoptera.

No. 104 - G. Botwright, 32, Haling Park Road, South Croydon, Surrey. Lepidoptera.

No. 105 - T.H. Fox, 226, St. Alban's Road, Watford, Herts. Lepidoptera.

No. 106 - S.C. Wincott, 75, Longhurst Road, Lewisham, London, S.E.13. Lepidoptera.

CHANGE OF ADDRESS:-

A.L. Capener (No. 6) to :- St. George's Home For Boys, P.O. Cleveland, Johannesburg, South Africa.

H.E. Chipperfield (No. 64) to:- 27, Chilton Avenue, Stowmarket, Suffolk.

RESIGNED :- Member No. 45. PRESENT TOTAL :- 96.

oOo

New member: No. 107 - P. Turnbull, 28, Larkspur Terrace, Newcastle-on-Tyne 2. Lepidoptera. (Wishes to know of any secondhand cabinet for sale.)

oOo

BRIMSTONE BUTTERFLY LARVAL HABITS.

On June 20th. I took five larvae of *Gonepteryx rhamni* (Brimstone Butterfly) on Costessey Common, near Norwich. One was recently hatched, and the others nearing the first moult. All displayed great irritation on being touched and rapidly doubled the first four or five segments of the body back so that the head was brought into contact with the tail. I tried each one several times and the response was immediate and "snappy." Quite a delicate stimulus provoked a reaction, e.g. if the larvae were lightly touched with the tip of a leaf of blackthorn (the food-plant), and wherever the contact was applied, even on the head itself, they snapped back like a shut-knife. I cannot trace any reference to this habit in the books to which I have access, but clearly it may be useful in warding off the attacks of ichneumons, and I shall be interested to hear if readers know of similar cases among other Lepidoptera.

[illegible]

oOo

THE
ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF
THE AMATEUR ENTOMOLOGISTS' SOCIETY

VOL. 2 NO. 21. PRICE SIXPENCE OCTOBER 1937

PRESENTED

CONTENTS.

TITLE	AUTHOR	PAGE
Editorial	Eds.	92
Ant-Collecting and Politics	A.N. Brangham	92
Calendar - October	B.A.C.	94
Clifden Nonpareil (C. fraxini)	A.N. Brangham	97
Formica rufa var. rufo-pratensis	A.N. Brangham	97
Beetle-Collecting in the Autumn and Winter	Geo. B. Walsh	97
Change of S.E.U.S.S. Recorders During 1937		99
Query No. 8	P. Walder	99
17	B.A.C.	99
Reply to Query No. 36	B.A.C.	99
Wants and Exchanges		100
Membership Changes		100
Comments and Diary Entries		100

There will no Bulletin in November, in accordance with the Society's usual custom. Members are nevertheless urged to send their material for publication to the Editors at the earliest possible date, as the Editors will be having particularly heavy work in producing the Reprint of Volume I.

COMMITTEE

BRITISH MUSEUM DEPARTMENT OF ENTOMOLOGY

HON. SECRETARY & EDITOR:
(to whom all matter for the Bulletin should be sent):
E.A. COOPER,
61, Okehampton Road,
London, N.W.10.

HON. ASSISTANT SECRETARY (to whom to apply if further Bulletins required):
C.H. VEALE,
8, Hurst Road,
Bexley,
Kent.

HON. EDITOR &
ADVERTISING SECRETARY:
A.N. BRANGHAM,
1c, Howitt Road,
London, N.W.3.
(Telephone: PRImrose 3073)

Published by the Society
in London.

THE ENTOMOLOGISTS' BULLETIN

is published nine times per year by the

AMATEUR ENTOMOLOGISTS' SOCIETY

The minimum annual subscription to the Society, including the year's Bulletins, is:-

Great Britain, Empire & U.S.A. ...	3/6 post free
Other Countries...	5/- post free

This should be sent to the Hon. Treasurer, B.A. Cooper, at 61, Okehampton Road, London, N.W.10. Postal Orders may be made payable at Kensal Rise, N.W.10. Bra nch Office. The subscription of those joining later in the year than September 1st. covers the period till the end of the year in addition to that of the following year. Back numbers are obtainable at two thirds the published price.

Authors desiring "extras" (reprints of their articles alone) may obtain them by ordering at the time of sending in the contribution at the following rates: First twenty ninepence, each succeeding twenty threepence per double side of printing. Typing appears as in the Bulletin, other matter on the same page being omitted.

The Hon. Secretaries will be pleased to forward a specimen copy of the Society's Journal and a prospectus to any non-member likely to be interested, on receipt of name and address. They will also gladly send prospectuses to those members who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage. If contributors desire return of their MSS after publication, would they please mention this when writing, and also enclose the required postage stamp. We are able to reproduce SIMPLE drawings and diagrams if authors send us a facsimilie drawn in Indian ink [illegible] the size they wish the reproduction (which must not exceed 7 ins. X 11 ins. in area) to appear.

The exchange column is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting for many years are advised to confine themselves to the exchange of ideas, apparatus, and live insects, leaving that of set, pinned and unpinned specimens till they have had more experience.

The Editors offer no guarantee for any articles offered in the Exchange column, and they are in no way to be held responsible should the privilege allowed be abused. Unless members state to the contrary, exchange notices will be inserted in the Bulletin once only. For addresses, please refer to the membership list and subsequent membership changes list.

Anyone at present not recording migrant lepidoptera and dates of first noting the species on the phenological list each year, who would care to note down and report anything connected with these subjects that he might observe, should write to B.A. Cooper or C.H. Veale for free literature and information. Any further information on migration will be gladly given by Captain T. Dannreuther, Windycroft, Hastings, and on Phenological Recording by Major H.C. [illegible], [illegible] Gerrards Cross, Bucks.

Books mentioned under the heading "Received" may be borrowed from B.A. Cooper, borrower paying postage both ways.

If there are any members living abroad or in the provinces, who are in the unfortunate position of not always being able to get the books they desire, we shall be glad to order it for them, postage only additional to the published price.

[illegible]

although [illegible] to assist in every possible way [illegible] entomology. Beginners are especially [illegible] write to the Editors

[illegible] OF [illegible]MENTS.

[illegible] advertisements (not [illegible]) [illegible] advertising [illegible] Street, [illegible] (Telephone number PRImrose 6073). Advertising 'copy' should be sent to Mr. Brangham by the 20th. of the month before the next issue of the Bulletin is published.

* *

H. K. LEWIS & Co. Ltd.
PUBLISHERS & BOOKSELLERS.

SCIENTIFIC BOOKS

ENGLISH and FOREIGN books on the Biological Sciences can be supplied from stock, or obtained prompty to order.

CATALOGUES are issued, and will be sent post free on request.

SECONDHAND BOOKS in all branches of science are available at the Secondhand Department, 140, Gower Street. Catalogues and quotations on application.

LENDING LIBRARY

The Scientific Library lends books on the pure and applied sciences.

THE ANNUAL SUBSCRIPTION is from one guinea.

BOOKS may be retained as long, or exchanged as often as desired. New books and new editions are added as soon as published.

DETAILED PROSPECTUS will be sent post free on application.

H. K. LEWIS & CO. LTD. 136 GOWER STREET,
LONDON, W.C.1.

* *

DUPLICATING - Have your duplicate and desiderata lists duplicated by the Society. Rate: First hundred like sheets 2/1d, each succeeding hundred 1 [illegible]. Profits to the Duplicator Fund. Only clean, well duplicated pages produced.
PRINTING - Name and locality labels, any wording, in finest type (6 point Cheltenham or Cheltenham bold), 2/6d per 250 alike, 6/- per 1000. Saves much time label writing, and is far neater in the bargain.
BINDERS - For the Entomologists' Bulletin. Spring Back. Keeps Bulletins flat and protects them from dust or careless handling. Price 2/9, post free.

ESHER
Surrey
: 19
B. A. Cooper

A reprint of all the more important articles from Volume 1 of this Journal is now being produced. Between thirty and forty pages long, it will cost 2/-. Contains many useful hints and suggestions for collectors. As only a limited number of copies are being produced, make sure of yours by booking early.

Let the Society benefit from your wants in these directions. Obtainable from B.A. Cooper.

You can ALWAYS obtain
OVA, LARVAE,
PUPAE,
& SET SPECIMENS
of British & Foreign Lepidoptera.
Dogs, Birds, Bees, Honey,
Cavies, Cigarette Cards and Books (all subjects)
From:
"THE BALLINGER BUTTERFLY AND BREEDING FARM"
Head Office: "The Cottage", Canham Road, London, W.3.
Phone: ACOrn 3234.
Lists Free.
Discount given to members of the A.E.S. quoting their membership number.

oOo

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY.

Vol. 2 No. 21 October 1937

Dear Fellow Members,

October is the month when we, as Editors and general holders of the Society's slender money-bags, are obliged to consider how we can use the financial resources of the coming year to the best advantage. There is no need to repeat that we are well satisfied with the course of the financial year of 1937, but we are sorry to have to announce that certain factors completely beyond our control are causing us to view the situation for 1938 with greater carnestness. These factors are the rise in cost of materials essential to the construction of the Journal. It seems as though we must apologise immediately to Mr. Abell after our reply to his appreciative letter in the previous Bulletin. We shall be compelled to raise the subscription to 4/-. Nor will we be able to produce the tenth Bulletin which we hadfondly hoped to do. As you know, it has been our policy to open to discussion any such important suggestion as the one we are making here, and we would like, inconsequence, that any member who feels that the Society is not offering sufficient for the subscription he is paying, should write to us at once and state frankly that this is causing a hardship, for, rather than lose membership, we would tighten our belts in other directions. At the same time, we are confident that we shall obtain further facilities for members in the shape of dealers' discounts.

The reprint from Vol. I is now well on its way to completion. Several articles have been enlarged, most rewritten and the whole has been rearranged for easy reference. Many members have complained that their hektographed originals are fading into oblivion. Our reprint will certainly not do that. New members will be interested in the first twenty-five queries (although many have yet to be answered) and replies, while the hints on collecting should be of value to all. At least thirty copies of this reprint will have [illegible] the original outlay. At the time of going to press we have [illegible] represents a third of our total membership; we are confident that our minimum estimate will be far exceeded.

Recent bad printing in the Bulletin has been traced to a faulty roller, which has now been returned to the makers. It is hoped that no more trouble will be caused through this.

Yours sincerely,

B.A. COOPER,
A.N. BRANGHAM.

oOo

ANT-COLLECTING AND POLITICS.

Actually, I went to Germany to have a good rest, and, like all good members of our Society, to participate in a little entomological recreation at the same time. Armed with the usual bottles, trowels, lens, and setting apparatus of the myrmecologist, I travelled to Berlin, or rather, to a delightful suburb on its outskirts. The first few days promised well, as any myrmecologist will gather when I say that such species as Acanthomyops mixtus, and [illegible] and Leptothorax nylanderi were quickly discovered and placed into observation nests.

I feel sure that our members will support me when I maintain that entomologists should be permitted - within reason - to transgress the normal laws of civilised countries; for example, when it says "Trespassers will be Prosecuted", I believe that this rule should apply with the single exception of insect hunters, provided that they are not out to capture, shall we say, a few hundred Deaths Head Hawk Moths, or crates full of Swallowtail Butterflies - if they can get them. No, all within decent reason. But I will not try to bias your opinion; let the facts of the case speak for themselves.

On the outskirts of Berlin are enormous woods; you can ride through them for hours on end and see only pine trees and [illegible] sandy lanes, and insects and birds.

These woods belong to the city of Berlin, known colloquialy as "Stadtforst." And when you approach such a district, you cannot escape seeing certain white notices suspended above the barbed wire. These notices tell you that you must not smoke, you must not cycle, you must not touch the wild life - "Schongebiet," that is, "A Preserve." Good, as I said above, with the one reservation.

One very warm and tempting morning I took my bicycle - you can see already how the plot thickens, as I have confessed to my first illegal instrument - and gaily rode into the Schongebiet. I had already done the same thing dozens of times before. I rode for a long time, right into the heart of the wood, crossing over the main arterial road leading to Berlin. By the side of a sandy track I undid my rucksack, removed the trowels and bottles and began to dig. I placed myself in such a position that I could see anybody approaching from either direction, because, I always think it is very hard to have to explain to one of these foreigners just what one is doing, digging up ant-heaps. You make such a fool of yourself.

On this particular and fateful morning I had discovered Formica fusca var. rubescens. Just imagine! My caution was relaxed, and before I knew where I was, I heard a crunch of footsteps on the sand, and the orthodox German greeting was bellowed into my ears from two different voices - two voices with but one intention. I raised my head. Over me stood two men in resplendent uniforms. One was the uniform of a policeman, and the other the uniform of a forester, complete with gun and field-glasses. For the convenience of my readers, the rest of the conversation will be translated into our own tongue.

"What are you doing here?" This from the policeman.

"Digging up ants' nests."

"What for?"

"I study them."

"Hm!"

I had baffled him there, but the policeman returned grimly to the attack, and threw out his portly chest.

"That is illegal. Have you been cycling?"

"I have."

"That is illegal. Do you not know that it is illegal to cycle in the forest? It is also illegal to collect ants' nests in the forest. The forest is "Schongebiet." Did you not see the notice - the one with the black band on white metal at the edge of the forest?"

"No." Which was a lie.

"Where do you come from?"

"Frankfurt." Which, as all our readers will know, is also a lie.

"Address?" And out came that little black book which is feared in any country. I gave some spurious address in that town. All this was noted down in stony silence.

"Name?"

I gave a name which was maliciously directed at a certain leader of the German political system, not because politics interested me just then, but because I felt that this was the opportunity for the schoolboy to poke fun at the headmaster, and perhaps get away with it.

There was a moment's silence. Then:-

"Have you been smoking?"

"What has smoking got to dowith ant-collecting?"

"You have already broken two rules, you might just as well have broken a third."

This logic staggered me.

"You must put the ants back where you found them."

"I cannot do that. My life depends on them" or words to that effect - "I am writing a book; they are for research of the greatest value to the State. This is Formica fusca var. rubescens."

Formica fusca var. rubescens conveyed nothing.

"You must walk home through the woods."

"That will take hours."

"You must walk home through the woods."

"Can I not take the main road to Berlin instead?"

"You must walk home through the woods."

I walked. He went on bicycle. The forester had vanished. We went on interminably. Then he stopped, and with a few curt words gave the salute, and swung on to his bicycle. I walked on [illegible] peeping from behind a bush, and [illegible] behind that. As soon as he saw me he mounted his bicycle again and sped off. This little comedy of darting behind bushes and then rushing off again continued for at least five times, until we came to the exit. He stopped me once more.

"This is State land. It is "Schongebiet" It is illegal to collect the animals; it is illegal to cycle; it is illegal to smoke. You will have to pay a fine"

"But I have no money"

"A summons will be sent to your address"

He saluted. I jumped on my bicycle, already hours late for lunch. I turned round to take one last glance of fury, but the young policeman had already vanished into the pub near-by and was happily ordering his lager.

The next day, the headlines of the local newspaper, read by most of the inhabitants of Berlin, said: "Ants are protected by the Government. It is ILLEGAL to disturb the nests of the Wood Ant" Now of course, every myrmecologist knows that *Formica fusca* var. *rubescens* could not be called the Wood Ant, not even with the biggest stretch of the imagination.

Perhaps I should have made that clear to the policeman after all.........

A.N. BRANGHAM.

oOo

CALENDAR - OCTOBER.

The following larger lepidoptera are abroad during the month of October:-

Herse convolvuli (Convolvulus Hawk). A migrant, only found some years, chiefly on the south coast. At flowers.
Ptilophora plumigera (Plumed Prominent). Males come to light. Maple hedgrows on chalk.
Poecilocampa populi (December Eggar). On fences. Males at light.
Sarrothripa revayana (Large Marbled Tortrix). At ivy and sugar. Oak woods.
Diloba coeruleocephala (Figure-of-Eight). Males at light.
Heliophobus hispidus (Beautiful Gothic). South coast.
Aporophyla lutulenta (Deep-brown Dart). Commonest on coast.
A. nigra (Black Rustic). Most common in north.
A. australis (Feathered Brindle). Most common on south coast.
Epunda lichena (Feathered Ranunculus). On coast.
Dosypolia templi (Brindled Ochre). On coast.
Polia flavicincta (Large Ranunculus). At sugar, England.
Miselia oxycanthae (Green-brindled Crescent). At sugar everywhere.
Agriopis aprilina (Merveille du Jour). At sugar. Oak woods.
Phlogophora meticulosa (Angle Shades). At sugar, everywhere.
Ochria ochracea (Frosted Orange). Among thistle. Flushed by day.
Caradrina quadripunctata (Pale Mottled Willow). Sugar, flowers. Near hay stacks.

Many species of *Orthosia*, *Xanthia*, *Mellinia*, and *Conistra* come to sugar and ivy-blossom at this time of year, and because of their beautiful colouration, are much prized by beginners.

Hoporina croceago (Orange Upper-Wing). Oak woods in the south.
Scopelosoma satellitia (Satellite). Common everywhere.
Xylina semibrunnea (Tawny Pinion). Common in the west.
X. socia (Pale Pinion). Similar to the above.
X. furcifera (Conformist). South Wales in alder glades.
X. ornithopus (Grey-shouldered Knot). Among sparse oaks.
Calocampa exoleta and *C. vetusta* (Sword-Grass and Red Sword-Grass). Most in north.
Scoliopteryx libatrix (The Herald). At sugar, especially in moist localities.
Chesia spiatiata (The Streak). Among broom.
Triphosa dubitata (Tissue Carpet). At ivy and ragwort.
Cidaria sitenata and *C. miata* (Red- and Autumn-Green Carpet)..Ivy.
Thera juniperata (Juniper Carpet). Among foodplant.
Oporabia dilutata (November Carpet). Everywhere. Comes to light.

Two species each of *Cheimatobia* (Winter moths) and *Hybernia* (Umber moths) will also be seen in most places, the wingless females, however, being very hard to detect. They are easily reared, if kept moist.

HINTS FOR BEGINNERS - SETTING.

One of the first difficulties a beginner will come up against is that provided by the obstinate specimen to set. The reasons for its being so may be many, and the following article will endeavour to clear up these difficulties.

KILLING - The first necessity for good setting is that the insect must be quite "loose" - in other words, the specimen must have its legs, wings, antennae, and other parts which one may wish to arrange in such a condition that they are in no way damaged by their manipulation under the setting needle. It is for this reason that I strongly recommend every beginner to use liquid ammonia for killing most captures. Insects are perfectly relaxed for setting whether they are left in the gas for five minutes or five days, and they require no relaxing unless the weather be extra hot. Ammonia solution of a specific gravityof .880 is required (obtainable from all chemists as 880 ammonia) rather than ordinary cleaning ammonia which is too weak for the purpose. Every collector may devise his own type of killing-bottle (my own is unique, I believe, but very effective), the principle of each being that the solution is absorbed by blotting-paper or cotton wool, the gas passing into the part in which the organisms are to be killed - in no case should the insects be allowed to come in contact with the ammonia solution. For use in the field, "solid ammonia" bottles are preferable, the commercial ammonium carbonate slowly decomposing into ammonia and carbon dioxide. Insects killed thus may be pinned in the field, or placed direct into a relaxing tin, and held down by cotton wool, where they will remain relaxed for long periods. The only disadvantage of ammonia is that certain colours are apt to change if specimens are left in it too long, while one or two change immediately. Greens instantly turn yellow, some whites slowly yellow, some reds and blacks slowly brown, The undersides of Blue Butterflies instantly go yellow but this vanishes on removal of the specimen from the killing-bottle. Immediate setting is always advisable.

Cyanide likewise causes certain colours to change and specimens always require to be relaxed afterwards (if left in the killing-bottle over twenty-four hours they are in a setable condition, but the legs and antennae are very brittle and liable to be broken off). Other killing fluids (chloroform, benzine, carbon tetrachloride, ethyl acetate, ether, and so on), are very liable to stiffen the specimen, after which it is not always easy to relax without some tendency to "spring", if kept in a moist atmosphere. The laurel bottle is used by many and it is a good substitute for cyanide (crushed bruised laurel leaves, which must not be of the varigated species), Insects keep well in it, and it is not harmful to greens. For these a strong solution of oxalic acid stabbed beneath the thorax with a fine-nibbed pen or needle is very useful - the insect may first of all be stupified with chloroform. Burnets are not usually quickly killed by cyanide, while their colours may be slowly dulled by ammonia; kill, therefore, by immersion in petrol or carbon tetrachloride, drying on a sheet of blotting-paper before placing in relaxing tin. Newly emerged specimens and those taken at sugar should not be killed (unless they show signs of damaging themselves) till some hours after capture - for one reason their excrement may spoil themselves or others in the same killing bottle.

RELAXING - The water moistened tin is the simplest way , both from the point of view of making and using. Mould may be prevented by the addition of a small crystal of phenol (carbolic acid) to the water used in moistening the samd, cork, or flannel on which the specimens to be relaxed are laid. Another type of tin, pleasantly scented with oil of bitter almonds, is on the market, but this possesses the disadvantage of requiring periodical "recharging". If cyanide is used, leave the specimens in the killing-bottle for at least an hour and then transfer them to the relaxing tin. The relaxing period varies with the species, specimen, weather, but roughly speaking, the times are thus: for Waves and Pugs, 18 hours usually sees them relaxed; larger Geometers and Butterflies become limp in 24 hours; Noctuas and Notodontids may require up to 48 hours, while Hawks and other large moths need from two to four days. For "micros" it is essential that ammonia be used as these little insects are very easily damaged after relaxing.

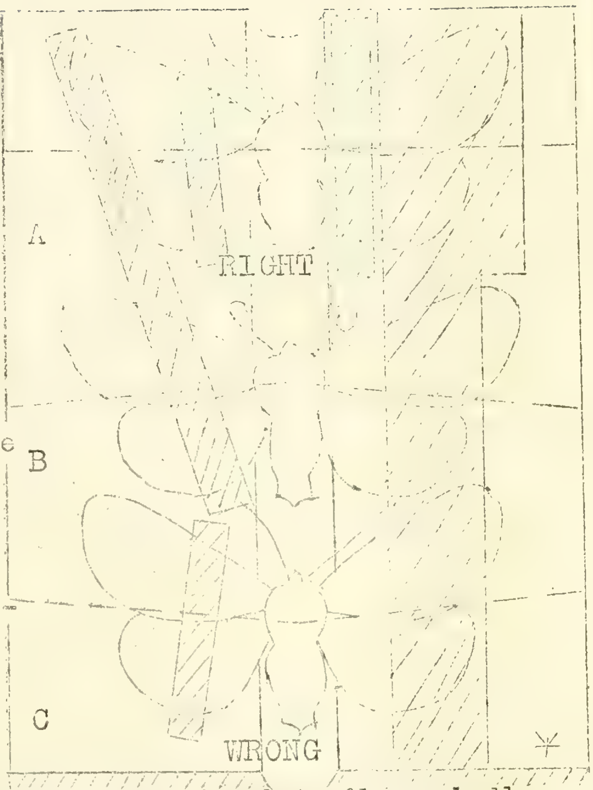
PINS - It is difficult to advise on the size of pin to use as this will depend on those stocked by your dealer. The two British makers (Kirby, Beard and D.F. Tayler) stock different sizes. To begin with it is best to try mixed sizes, and later to buy quantities of those you find most suitable. I have found that mixed boxes generally contain rather an excess of pins too large to be used often.

In D.F. Tayler's sizes I have used No. 16 for large Hawks; No. 12 or 10 for large Noctuas, Arctiids, Lasiocampids; No. 6 for most Noctuidae and larger Butterflies; No. 13 for small Butterflies and Geometers. Black pins are strongly recommended, but personally, I have only used them in the larger sizes as enamelled small pins are very liable to bend or even break off unexpectedly on meeting hard cork, after which very little can be done with the specimens. Partly because of their greater strength and partly because they are not liable to "verdigris", the spoiler of many an old collection, I was compelled to change over to Continental black, stainless steel pins, using white stainless steel headless pins for small butterflies, geometers, and other smaller-bodied insects. The only disadvantage is that the heads of the long pins require cutting off to make them short enough for the English storebox, but this is of no great inconvenience if done during the winter. The white headless pins (1x for micros, 2 for pugs, carpets, 3 for larger geometers, Footman, etc.) are very much recommended for the smaller insects, even where English pins are used for the larger specimens. No. 2 in Continental sizes is a useful general purpose pin.

PINNING - In pinning, the specimen should on no account be touched with the fingers. A tablecloth of some woolly material is ideal for the purpose, the insect being turned over with a pin or forceps. If such a pinning surface is not available, the specimen may be picked up by gripping the thorax with forceps, but even here, great care is required. The pin should go through the centre of the thorax, perpendicular to the general line of the body - rakish angles either towards or away from the head are generally proofs of bad setting. It should not be forgotten that "an insect well pinned, is an insect half set", and this is as true today as it was in the days of very low setting. It is difficult to regulate the height of a specimen on a pin, but most people fix an arbitrary height for each size of pin at which they endeavour to place all their specimens. This should be chosen as high up the pin as cork at the base of the setting board groove will allow. Setting stages (as pictured in South's Butterflies) are easily made and very efficiently standardise the depth of pinning. Nevertheless, if a pin refuses to go deeper into the cork, very few will do else than push the specimen lower on the pin.

SETTING BOARDS - Every beginner should make a good start by using flat setting boards. A few may later turn to round boards, according to fashion, but to my mind, the sooner this practise ceases, the better for British entomology. The beginner will learn to set well quicker on a flat board, and, even if bad setting is more noticeable, the general effect will look neater. It is a very good plan to paper the boards with lined paper as uneven setting then becomes obvious instantly. If the specimen is not pinned straight this is not always easy to rectify in setting.

SETTING - There are two methods of setting in general use today, although a few collectors still have their own unorthodox methods and produce very good results with them. The first method requires a strip of transparent paper each side of the groove, setting being begun in the centre of the board and working towards each end, in order to minimse displacement of the setting paper. That this is an undoubted advantage will be realised by anyone who has tried commencing both at the middle and at one end of the board. The transparent paper may be taken from cigarette packets, cereal food packets, book dust covers, or bought in rolls or sheets of tracing paper. A certain amount of greasiness does no harm in the setting, provided the insect does not revive and have to be put out of its agony by pouring benzene over it, when the wings may stick to the board. The wings should be wholly covered with paper, except in very close proximity to the thorax, where a narrow strip of paper may be added when setting is otherwise complete to keep legs and antennae in position. Setting strips, especially when of thick material such as cellophane or used roll-film washed in NaOH (caustic soda) water, can only be used once on each side, after which it must be thrown away. This method is about twice as fast as the following, which, in addition, possesses the disadvantage that it is more liable to leave a mark across the wing bounding the setting strips if the wing is at all hairy or thickly scaled. On the other hand, any fairly thick paper, which need not be transparent, is suitable for the setting. Setting strips or "slats" should be cut during the winter so that no time shall be wasted in the busy season. It should be remembered that by this method edges of wings are liable to turn up in drying if not covered by a slat, a procedure one is very tempted to follow when in a hurry



The wings are lifted into position by means of a pin or setting needle pressed against the costa or other wein of the wing. If properly relaxed, there should be no trouble about pricked or slit wings. Large Moths and Skippers may occasionally prove difficult to manage and may require the use of a sharp penknife or razor-blade to sever the muscle at the base of the wing. A board should be chosen where the groove is not too large, nor do the wings overlap the edge, where they may curl, or be accidentally knocked - a matchstick pinned below will safeguard against such an accurrence. Fore limbs (at least in moths) and antennae should be teased out in fromt, while the abdomen should be raised with a pin into the plane of the wings. Undersides are generally neglected by collectors, but, even in moths, interesting variations occur, and at least one male and female of each species should be set in this manner (in butterflies undersides are frequently more variable than uppers). A general rule in regulating the position of the wings is that the lower edge of the upper wing should be at right angles to the body, the lower wings being drawn up a corresponding amount, not always easy to judge. See Richard South's Butterflies - those in plate 61 are badly set, while those in plate 65 are all well set. Personally, I deviate somewhat from the above rule sometimes - Noctuas a little above the right angle line, Geometers rarely below, but it is very unwise to do this until one has been setting for some while. With insects other than Lepidoptera, departures from the rule may be more marked, as also with "micros" especially the plumes and clearwings, when this may be considerably exceeded for good effect, as will soon be discovered, but the emphasis to be laid on the above rule cannot be over-estimated. Bad setting has on many occasions led to a collector's eventual loss of interest in this excellent hobby.

The insects should be allowed to dry for at least a fortnight, longer for the larger species, in a receptacle that is NOT airtight, and yet well supplied with napthalene to prevent mites. After removal from the boards specimens should be handled only with forceps, and kept in a very nearly airtight (not quite or mildew may appear) storebox or cabinet. The data label for the specimen should be written as soon after setting as possible. If the pin is likely to bend, it should be placed in a short length of polyporus, a strong pin holding it at the other end. For those living in damp houses, the specimen may be permenantly hardened by exposing it to the vapour of formalin (40% formaldehyde) for an hour or so. This is also a deterrent to mites and mildew, but the specimen cannot be reset afterwards.

B.A.C.

oOo

Catocala fraxini (Clifden Nonpareil) was recorded in the Ashford district of Kent on September 12th., at sugar. This rare insdct is captured in very small numbers almost each year in this country. A.N.B.

oOo

Formica rufa var. rufo-pratensis, a species of ant which is very localised in Great Britain, and which exhibits the characteristics of both F. rufa, and F. pratensis in varying degrees in the same colonies, was taken by myself on Weybridge Heath, Surrey, on September 12th. This species has not been recorded there yet, the nearest being the Isle of Wight. A.N.B.

oOo

BEETLE-COLLECTING IN THE AUTUMN & WINTER.

The coleopterist unlike the majority of entomologists can be just as busy collecting in the autumn and winter as at any other time of the year.

The water-net should be used whenever opportunity serves, care being taken to work well under the banks, among the water-weeds and into the mud. The genus Haliplus is most in evidence during the winter, and species such as Hydroporus oblongus are best obtained in the early spring.

It should be remembered that different types of locality will yield different species of aquatic coleoptera, and so search should be made in ponds, slow-running streams, quick-running streams with or without a gravelly bottom, and peaty pools. I have had good results in October by working the moss in and below waterfalls, species such as Quedius auricomus, Stenus guynemeri and Dianuus coerulescens favouring such localities.

Thick moss in other localities often well repays search. In November I find Mniophila muscorum and [illegible] cyaneus in thick tufts of Mnium hornum growingby the [illegible] side, and when the sphagnum is drying in the spring, species of Lesteva can be found. These can be brought home in sacks, but they form wet and heavy loads even in a car; and I find it better to pull them to pieces in the field over a rubber sheet, reject the coarser material, and bring the rest home for examination ona meat-dish.

Haystacks in different localities will give a host of common things with an occasional rarity to lend zest to the search. The material required is the damp finer material at the base, not the dry hay. The best stack I ever examined was one that had been standing derelict for some years, and was going mouldy at the bottom, some parts being quite warm owing to chemical change. This repaid examination over several winters, until at last cattle got to it and ate it all.

The turning over of stones in suitable places is often profitable, on our Northern Moors species such as Bradycellus collaris, Pterdstichus adstrictus, Calathus erratus and Carabus arvensis being found. On bare patches there is often a felted growth of algae, and if this is turned over, species such as Bembidion mannerheimi, B. nigricorne, Tricnocellus cognatus, and Bradycellus similis are quite common with us; the same species with others such as Carabus nitens and Cymindis vaporariorum can be found by searching at the roots of heather or by turning over the peat in peat-cuttings.

Moles' nests contain species of coleoptera most unlikely to be met with anywhere else. The nest heap can be distinguished from the ordinary upthrows by its much larger size. Dig down into the middle of it with a trowel until the hollow is found containing the nest; this is usually only a few inches below the surface of the ground. The nest is about the size of a man's head; it should be removed intact with both hands and spread on asheet; the coarser parts can be rejected, the larger species of beetles such as Quedius othiniensis being tubed, and the rest examined at home for little species like Ptenidium laevigatum. If beetle larvae are found they can often be bred by putting the contents of the nest into a tin, merely keeping them moist; in this way I hae had Quedius nigrocoeruleus. Many fleas of several species will doubtless be found, but it my experience they do not trouble man.

In the autumn, fungi yield a rich harvest. The fresh specimens, of course, contain little, but older ones should be pulled to bits over a sheet. The smaller Staphylinidae are best put into a tube alive; the lower end is dipped into boiling water until all the beetles are dead - about three seconds; they are then wrapped in a little tissue-paper which is put into a laurel tube; when the beetles are relaxed (in about three days) they can be set as usual. In this way good specimens are obtained without matted pubsecence. The fungi that have been examined should be put in a heap at the foot of a tree, and further examined at intervals of two or three days.

Most coleopterists cease using their sweep-nets too early in the season. Good catches can still be made in October. In this way I have taken Apion pallipes in numbers on Dog's Mercury and Garlic, together with good specimens of several species of [illegible]. [illegible] sweeping in the woods has yielded species of Liodes.

Carrion traps can be kept going all through the winter and during warm periods hundreds of specimens of Catops and Choleva will be found. Frost, however, checks [illegible].

Corn mills and bakeries will yield supplies of beetles peculiar to those localities; five minutes' sifting of infested corn has yielded hundreds of Calandra spp. and a few [illegible]. In the flour stores of bakeries, folded bags should be searched between the folds and just within the bag, and crevices should be examined, especially where the floor meets the wall.

Finally, flood-refuse as during the summer will yield thousands of specimens in [illegible] of the material [illegible] be taken home and examined at leisure. [illegible] at a time to find what is present, and leave the bag out in the open. In this way it is kept sufficiently moist to maintain the life of the beetles, and it can be further examined as opportunity occurs.

GEO. B. WALSH.

oOo

CHANGE OF S.E.U.S.S. RECORDERS DURING 1937.

The following changes in the Recorders for Migration should be noted by members when sending their records for the year:-

Cambs and Hunts - E.R. Smith, The Laurels, Downham Market, Norfolk.
Wiltshire - C.M.R. Pitman, 39, Rampart Road, Salisbury.
Nottinghamshire - A. Roebuck, N.D.A., F.R.E.S., c/o Curator, Natural History Museum, Wollaton Hall, Nottingham.
Derbyshire - A. Roebuck, N.D.A., F.R.E.S., The Laurels, Kegworth.
North Wales - Dr. I. Thomas, M.Sc., Ph.D., University College of North Wales, Memorial Buildings, Bangor, Caenarvonshire.
Cheshire - H. Driver, B.Sc., 3, Woodcroft Lane, Babington, nr. Birkenhead.
Aberdeenshire - Dr. G.D. Morison, Ph.D., B.Sc., F.R.E.S., North of Scotland College of Agriculture, 41½, Union Street, Aberdeen.

oOo

QUERIES.

Query No. 8. In my back garden a large poplar tree produces dozens of Poplar Hawks (Amorpha populi). Three years ago I took about eighteen larvae to see if I could get any vars for the cabinet. All came out at the usual time bar one late specimen which did not emerge till August 29th., and was of a very light tint. The next year, 1936, I took some more, the same happening again, as one emerged on August 21st., but crippled. So this year, 1937, I collected about three dozen, hoping to have the same luck. All except one emerged at the proper time, this last having just come out (September 5th.), and it is very light. I have mentioned this as it is to me an unusual occurrence. I should very much like to know whether this light form is caused by its late emergence, and why.

P. WALDER.

Query No. 17. What becomes of the egg-parasitic Hymenoptera on their emergence? Some which emerged from Buff Tip (Phalera bucephala) eggs, after their normal hatching time obviously could not find other eggs of the same species to parasite. Do they parasite other species' eggs? Do they mate the females hibernating till the following June? Do both sexes hibernate and mate the following spring? Or do they behave outside any of these suggestions? This is a point which members who breed these from their ova should try to investigate as but little is at present known of these organisms.

B.A.C.

REPLIES TO QUERIES.

No. [illegible]. Firms abroad with whom I have had dealings are as follows:-
India - H. Robertson, Cherrapunji, P.O. Khasi & Jaintia Hills, Assam.
A.N. Dumai, Cherrapunji, K. & J. Hills, Assam.
U.S.A. - Elliot A. Maynard, 1192 Lewiston Avenue, Rochester, N.Y.
Herbert A. Jungmann, 1320, No. 15th. St., Milwaukee, Wisconsin.
Joseph N. Lang, 1433 So. 59th. Ave., Cicero, Ill.
E. Eugene Smith, 2013 Christine Ave, Amaiston, Alabama.

Private persons requiring small quantities from abroad do not pay so much in [illegible] needing these for resale or stock requirements. There must be many more known to members - we should like to have the list as complete as possible. When writing, perhaps members would mention the Entomologists' Bulletin.

B.A.C.

oOo

WANTS & EXCHANGES.

W.N. Roberts (No. 77 - please note change of address), wishes to exchange a 2 inch and a 4 inch round-type setting-board for flat ones. They have a 13 inch base, to fit a portable drying case, the corked length being 12¾ inches.

P. Walder (No. 102) wants larvae or pupae of *Fluctuosa* (Satin Carpet or Lutestring), and *gonostigma* (Scarce Vapourer). He offers larvae of *smaragdaria* (Essex Emerald), *apicaria* (Bordered Beauty) ova, and fine set specimens of *machaon* (Swallowtail Butterfly).

Sir Murdoch C. McLeod (No. 35) has not got copies of Journals 1 - 5, and 13. Perhaps some member would oblige and lend him these so that he can make a typewritten copy - they will be taken infinite care of and returned safely.

T.H. Fox (No. 105) offers for exchange ova of *C. nupta* (Red Underwing), and *P. populi* (December Moth) (after late November). Wanted in exchange ova or larvae of any Fritillaries.

oOo

MEMBERSHIP CHANGES.

Newcomers:-

No. 108 - Mrs. L.M. Britton, Springfield Manse, Addingham, Ilkley, Yorks.
Lepidoptera (British and Foreign).

No. 109 - H. Wright, Clematis, Owton Manse Lane, West Hartlepool, Durham.
Coleoptera and Lepidoptera.

oOo

Change of Address:-

No. 77 - W.N. Roberts to: "Ashley", Manor Drive, Whetstone, London, N.20.

No. 1 - L.R. Tesch to: Estate Office, Whaddon, Bletchley, Bucks.

oOo

PRESENT TOTAL: 99.

oOo

COMMENTS AND DIARY ENTRIES.

B.G. Leonard notes two types of larva among those of *Smerinthus ocellatus* (Eyed Haw). The one is bright green, while others are more a whitish blue, after the style of the Poplar Hawk. Both were fed on the same foodplant.

T.D. Fearnehough tells us that he is still hard at work mking paintings of the species of the genus *Papilio* (Swallowtails). HE has already dealt with some 70 species, and would be glad of any help members might be able to give to him in the way of letting him borrow specimens, etc.

Henry G. Morgan sends us the following notes on *Polygonia c-album* (Comma). Until 1933 this species was almost unkown at Lavington (Wilts), when one or two specimens only were seen. In 1934 and 1935 they were common, but only one was noted in 1936. B.A. Cooper also motes a similar reduction in numbers in both Herts and Surrey for both last year and this. G. Burt notes it as somewhat scarcer this season in Dorset, but it is still common there. Is this so throughout the south of England? Noone has yet been able to offer an acceptable explanation on the sudden spread of this species over England since the War and no doubt these fluctuations will likewise be unexplainable, whether permenant or temporary. Reports welcome.

PHENOLOGICAL OBSERVATIONS

Date of appearance of the following lepidoptera, Average, Hastings 1936 records, and column for members' records.

SPECIES	AVGE	(H.G. McLeod) HASTINGS 36	MEMBER'S OBS. & NOTES
H. marginaria(Dotted Border)	17/2	29/2	
T. stabilis(Common Quaker)	10/3	10/3	
M. multistrigaria(Mottled Grey)	21/3		
X. areola(Early Grey)	23/3	4/4	
A. badiata(Shoulder Stripe)	29/3		
P. rapae(Small White)	4/4;20/7	21/7	
S. bilunaria(Early Thorn)	4/4;24/7	29/4;30/7	
P. gamma(Silver Y)	6/5	7/5	
T. punctularia(Grey Birch)	30/4		
X. fluctuata(Garden Carpet)	30/4;21/7	6/5;30/7	
L. argiolus(Holly Blue)	30/4;26/7	3/5; 3/8	
C. ferrugata(Red Twin-Spot Carpet)	13/5;27/7		
C. luteolata(Brimstone Moth)	13/5;10/8	8/5;12/8	
C. pamphilus(Small Heath B.)	19/5	16/5	
S. menthastri(White Ermine)	20/5	28/5	
A. plagiata(Treble Bar)	22/5;15/8		
X. montanata(Silver-Ground Carpet)	22/5	27/5	
H. lupulenis(Common Swift)	23/5	23/5	
T. jacobaeae(Cinnabar)	23/5	28/5	
P. icarus(Common Blue)	25/5;30/7	16/5(Wannock);25/8	
M. dentina(Shears)	1/6	10/6	
S. lubricipeda(Buff Ermine)	2/6	24/5	
M. trigeammica(Treble Lines)	3/6	28/5	
C. venata(Large Skipper)	8/6	5/6	
C. bilineata(Yellow Shell)	9/6	7/6(T.D.)	
M. strigilis(Marbled Minor)	12/6	27/5	
M. jurtina(Meadow Brown)	13/6	14/6	
Z. filipendulae(6-Spot Burnet)	18/6	27/6	
T. pronuba(Large Yellow Underwing)	20/6	17/6	
X. monoglypha(Dark Arches)	22/6	7/6	
P. chrysistis(Burnished Brass)	22/6	20/6	
M. persicariae(Dot)	2/7	11/7	
A. grossulariata(Magpie)	5/7	28/6	
B. gemmaria(Willow Beauty)	6/7	20/6	
L. lithargyria(Clay)	6/7	24/6	
O. sambucaria(Swallowtailed)	8/7	5/7	
L. conigera(Brown-Line Bright-Eye)	8/7	12/7	
B. perla(Marbles Beauty)	9/7	24/6	
P. similis(Yellow Tail)	10/7	11/7	
A. urticae(Small Tortoiseshell)	12/7	20/6	
C. trapezina(Dun Bar)	16/7	30/7	
C. limitata(Shaded Broad Bar)	21/7		
N. io(Peacock B.)	6/8	8/8	
O. antiqua(Vapourer)	10/8	7/8	
N. xanthog(Square Spot Rustic)	12/8	31/7	
T. popularis(Feathered Gothic)	28/8		
A. circellaris(Brick)	20/9		
A. lychnidis(Beaded Chestnut)	24/9		
O. vaccinii(Chestnut)	26/9		
M. oxyacanthae (Green Brindled Crescent)	3/10		
O. dilutata(November)	14/10		

NAME:.........................

ADDRESS:.........................

LOCALITY OF OBSERVATION............

RARE SPECIES SEEN 1936, HASTINGS:- D. chaonia, N. ziczac, L. camelina, H. derasa, P. flavicornis, D. pudibunda, S. pavonia, D. falcataria, C. glaucata, H. prasinana, P. fuliginosa, O. quadra, D. coryli.

The table completed as far as possible, should be returned to Major H.C. Gunton, c/o Royal Entomological Society, 41, Queen's Gate, London, S.W.7., by November [illegible]

(A. E. S. sup. No. 163)

DAY	APR		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV		DEC	
	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S
1.	--	[illegible]	[illegible]	[illegible]	--	1054	2318	1229	2341	1528	0052	1645	0231	1603	0507	1530	0617	1456
2.	0040	[illegible]	[illegible]	[illegible]	[illegible]	1208	2344	1348	--	1634	0210	1714	0345	1623	0616	1554	0717	1534
3.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--	1509	0041	1729	0326	1748	0458	1647	0722	1612	0811	1620
4.	[illegible]	[illegible]	[illegible]	[illegible]	0051	1440	0016	1629	0151	[illegible]	0445	1759	0609	1707	0826	[illegible]	[illegible]	1712
5.	0235	1144	0147	1309	0115	1609	0057	1744	0309	1845	0600	1819	0719	1725	0921	1736	0937	1811
6.	0301	1235	0207	1427	0144	1733	0153	1847	0430	1912	0714	1838	0826	1751	1016	1841	1010	1914
7.	0324	1414	0228	1549	0221	1854	0258	1958	0550	1935	0825	1859	0934	1821	1100	1919	1037	2020
8.	0345	1533	0250	1713	0310	2005	0414	2017	0707	1955	0935	1922	1036	1856	1136	2010	1100	2128
9.	0406	1655	0317	1840	[illegible]	[illegible]	0536	2047	0822	2014	1043	1949	1132	1940	1207	2124	1121	2238
10.	0428	1820	0350	2004	0521	2143	0657	2111	0934	2034	1148	2020	1221	2030	1233	2231	1141	2349
11.	0452	1947	0432	2121	0644	2220	0815	2132	1044	2055	1248	2059	1307	2127	1256	2341	1201	--
12.	0522	2113	0528	2225	0804	2247	0930	2151	1153	2119	1342	2144	1338	2250	1317	--	1227	0107
13.	0559	2223	0635	2315	0922	2309	1043	2210	1259	2143	1428	2239	1407	2358	1337	0054	1247	0220
14.	0646	2342	0751	2355	1037	2328	1153	2229	1402	2221	1507	2340	1432	--	1358	0208	1317	0339
15.	0745	--	0909	--	1149	2346	1302	2250	1500	2302	1540	--	1459	0048	1422	0326	1355	0500
16.	0854	0038	1026	0021	1259	--	1409	2316	1551	2352	1608	0046	1515	0201	1450	0447	1445	0619
17.	1008	0120	1140	0044	1407	0004	1515	2346	1635	--	1632	0157	1537	0317	1525	0611	1548	0729
18	1124	0152	1252	0104	1515	0024	1615	--	1711	0050	1653	0310	1559	0436	1610	0733	1702	0827
19.	1216	0218	1402	0122	1621	0046	1710	0022	1742	0155	1714	0426	1625	0557	1706	0848	[illegible]	0912
20.	1317	0239	[illegible]	0140	1724	0113	1758	0107	1807	0304	1736	0547	1656	0720	1816	0951	1946	0947
21.	1501	0258	1618	0158	1824	0145	1840	0201	1830	0417	1759	0703	1735	0847	1931	1040	2106	1015
22.	[illegible]	0316	1740	0217	1916	0225	1913	0302	1851	0531	1826	0825	1824	1000	2051	1119	2227	1039
23.	1718	0334	1850	0242	2002	0313	1940	0409	1911	0647	1859	0946	1924	1108	2209	1149	2336	1100
24	[illegible]	0352	1952	[illegible]	[illegible]	0410	2004	0520	1932	0604	1940	1105	2034	1207	2325	1217	--	1120
25.	1933	0414	2029	0345	2110	0513	2025	0632	1955	0923	2031	1216	2149	1246	--	1235	0047	1141
26.	[illegible]	[illegible]	[illegible]	[illegible]	2136	[illegible]	2044	[illegible]	[illegible]	1042	2133	1318	2306	1319	0038	1254	0157	1203
27.	2139	0509	2202	0619	2158	0732	2104	0901	2057	1202	2244	1407	--	1346	0149	1314	0304	1228
28.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2135	1018	2140	1317	2359	1446	0023	1409	0258	1335	0409	1258
29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2149	[illegible]	2234	1425	--	1516	0135	1429	0407	1358	0510	1333
30.	--	0729	2330	0630	2257	1112	2218	1254	2339	1523	0115	1542	0247	1448	0513	1424	0606	1416
31.			2351	0921			2254	1413	--	1608			0358	1508			0656	1506

TIMES OF MOON RISING AND SETTING
FOR LATITUDE 52
(April - December 1937)

LOCAL MEAN TIME, UNCORRECTED FOR BRITISH SUMMER TIME
(in hours & minutes)
Times for moon's upper limb

It is not possible here to explain the calculation for the error due to displacement from Latitude 52, but for places in the British Isles this will generally be found to be not worth worrying about. These tables should be of great value to those who undertake much night work, especially that involving the light or sugar-pot.

(A. E. S. sup. No. 16A)
April 1937

Keep this in your diary for ready reference.

THE
ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF
THE AMATEUR ENTOMOLOGISTS' SOCIETY

PRESENTED

VOL. 2 NO. 22 PRICE SIXPENCE DECEMBER 1937

BRITISH MUSEUM (NAT. HIST.) DEPARTMENT OF ENTOMOLOGY

CONTENTS

TITLE	AUTHOR	PAGE
Editorial	Eds	103
[illegible]	C.W. Baker, Lt(E) R.N.	103
[illegible]	A. F. O'Farrell	107
Editorial Note	Eds	107
Booth Museum Collections	B.A.C.	108
A Useful Breeding Device	J. E. Knight	108
Query No. 45	B.A.C.	108
46	B.A.C.	109
Replies to Queries No. 8	T. Bainbrigge Fletcher	109
17	T. Bainbrigge Fletcher	109
38	B.A.C.	109
43	T. Bainbrigge Fletcher	109
44	Ernest [illegible]	110
Wants and Exchanges		110
Membership Changes		111
Butterfly Collecting in Switzerland	D. T. Lees Smith	111

The next Bulletin, No. 23, will be issued in [illegible] 1938. [illegible] Editor not later than January 3rd. [illegible] Questionnaire should be returned as soon as possible.

COMMITTEE

HON. SECRETARY, TREASURER & EDITOR
(to whom all matter for the Bulletin should be sent):
B. A. COOPER,
61, Okehampton Road,
London, N.W.10.

HON. [illegible] SECRETARY (to whom to
apply [illegible]):
[illegible]
8, [illegible],
[illegible], Kent.

[illegible]
[illegible] SECRETARY
[illegible]
1[illegible]
[illegible]
([illegible])

HON. BUSINESS MANAGER
J. E. KNIGHT,
Toftrees,
Woodside Avenue,
London, N.12.

Published by the Society in London.

THE ENTOMOLOGISTS' BULLETIN

is published nine times per year by the

AMATEUR ENTOMOLOGISTS' SOCIETY

The minimum annual subscription to the Society, including the year's Bulletins, is:-

Great Britain, Empire & U.S.A. ... 3/6 post free
Other Countries... ... ... 5/- post free

This should be sent to the Hon. Treasurer, B.A. Cooper, at 21, [illegible] Road, London, N.W.10. Postal Orders may be made payable at Kensal Rise, N.W.10. Branch Office. The subscription of those joining later in the year than September 1st. covers the period till the end of the year in addition to that of the following year. Back numbers are obtainable at two thirds the published price.

Authors desiring "extras" (reprints of their article alone) may obtain them by ordering at the time of sending in the contribution at the following rates: First twenty ninepence, each succeeding twenty threepence per double side of printing. Typing appears as in the Bulletin, other matter on the same page being omitted.

The Hon. Secretaries will be pleased to forward a specimen copy of the Society's Journal and a prospectus to any non-member likely to be interested, on receipt of name and address. They will also gladly send prospectuses to those dealers who may be able to make use of them.

Will correspondents please remember that a reply can only be given other than through the Bulletin if they enclose a stamp for return postage. If contributors desire return of their MSS after publication, they should please mention this when writing, and also enclose the required postage stamp. We are able to reproduce SIMPLE drawings and diagrams if authors send us a facsimilie drawn in Indian ink [illegible] the size they wish the reproduction (which must not exceed 7 ins. X 11 ins. in area) to appear.

The exchange column is free to all members, and the Editors hope that full use will be made of it. Those who have not been collecting for many years are advised to confine themselves to the exchange of ideas, apparatus, and live insects, leaving that of set, pinned and unpinned specimens till they have had more experience.

The Editors offer no guarantee for any articles offered in the Exchange column, and they are in no way to be held responsible should the privilege allowed be abused. Unless members state to the contrary, exchange notices will be inserted in the Bulletin once only. For addresses, please refer to the membership list and subsequent membership changes list.

Anyone at present not recording migrant lepidoptera and dates of first noting the species on the phenological list each year, who would care to note down and report anything connected with these subjects that he might observe, should write to B.A. Cooper or C.H. Veale for free literature and information. Any further information on migration will be willingly given by Captain T. Dannreuther, Windycroft, Hastings, and on Phenological Recording by Major H.C. Gunton, [illegible], Gerrards Cross, Bucks.

Books mentioned under the heading "Received" may be borrowed from B.A. Cooper, borrower paying postage both ways.

If there are any members living abroad or in the provinces, who are in the unfortunate position of not always being able to get the book they desire, we shall be pleased to order it for them, postage being additional to [illegible]

all [illegible] to assist in every possible [illegible] Members are [illegible] the Editors

THE ENTOMOLOGISTS' BULLETIN

THE JOURNAL OF THE AMATEUR ENTOMOLOGISTS' SOCIETY.

Vol. 2 No. 22 December 1937.

Dear Fellow Members,

With this issue we complete our second volumn, and the 1937 season, poor in so many ways, likewise comes to an end. Although, owing to Editorial lack of time, the Bulletins have not been up to the standard planned, the Committee feel that members should be well satisfied with the year's activities. Lest this should be otherwise, a Questionnaire is enclosed with the subscription form, which it is hoped all members will return (irrespective of whether their subscription is paid or not), augmented separately with any thoughts, complimentary or otherwise, that may have struck them relating to our organisation.

Our numbers have now topped the hundred mark and there is every prospect, with the anticipated end-of-season resignations, that our numbers will not fall far below this figure during the early months of 1938. Even so, there seems no prospect, we are sorry to say, of having our Bulletins printed till our membership is very much higher than at present. So, may we repeat, still upward with the circulation, and on to the two hundred!

We conclude in the hope that the past year may have seen the retention in some of entomological interest that, without us, might have dwindled away, and that others may have found in us an incentive to further study, perhaps necessitating the addition to their mailing list of others of our more technical elders, to which we would add the wish that all our members may have a very happy Christmas and New Year.

Yours sincerely,

B. A. COOPER,
A. N. BRANGHAM,
C. H. VEALE,
J. F. KNIGHT.

oOo oOo oOo oOo oOo

ENTOMOLOGY IN CHINA

When looking through a book on our English Butterflies and Moths my mind wanders back overseas where, some time during the past 28 years, I have seen in profusion some species, a single specimen of which would gladden the heart of any British entomologist collecting at home.

For example, I well remember early one evening in August 1919, on the plains of Abraham, just outside Quebec, where, with historic thoughts, I wandered over where Wolfe and Montcalm fought out the destiny of Canada. Soon, however, all thoughts of great gentlemen of long ago vanished from my mind. Everywhere I was surrounded by what appeared to be C.hyale (Pale Clouded Yellow). They were there in dozens, and although without any apparatus, the task of emptying my matchbox and filling it with a few of these"flies"in perfect condition, was a very easy one.

From Dec.1932 to Mar.1935 I served on the China Station - a very pleasant job - and, being a shore one, it gave me a lot of time to study my hobby, to which every available spare moment was dedicated. I had from October to April or May in Hong Kong, and the summer in a small island in Northern China, named Liu Kung Tao, better known as Wei Hai Wei. Going north for the summer gave me the advantage of dodging the bad humid weather of Hong Kong, but made me miss collecting the many beautiful butterflies of that locality that had not arrived before I left and were over on my return in October. Hong Kong is an island off the mainland opposite Kowloon, in British New Territory. The ride around the territory is 56½ miles, through lovely country, a welcome trip for a hot and sticky night such as one gets so often in these parts.

I have little to tell about my stay in South China, but the following sight I shall never forget. A 20 cents bus ride from Kowloon brings one to a district known as Lai Chi Kok, and from here one may enter a really beautiful valley cutting through the hills to the main motor road around the territory. This place is known as "Butterfly Valley" or "Pass", and here in the winter months (January and February) one may see bunches of butterflies. They congregate in one part of the valley alone. This particular butterfly (unfortunately I have no book on the Lepidoptera of China [illegible] I cannot name it) measures about 3 inches across the [illegible] upper wings, [illegible] of a brown colour (females [illegible]) with a [illegible] sheen on the forewings similar to that of our A. iris (Purple Emperor). They were hibernating, and on sunny warm days were fairly active on the wing, although if dull all remained motionless. On the ground were dozens of wings, but never a body connecting them. I take it that the ants had been busy. Looking up into the trees you could observe these "flies" clustered together in large bunches. A large bunch would be as long as two feet and quite a foot in diameter. A few well directed sticks thrown into the trees and the whole place was full of "flies" lazily flapping around. One sweep of a large net could catch [illegible]

The only other winter pastime was collecting pupae of Attacus atlas (Atlas Moth), [illegible] (Tussock Silk Moth) and S. pavonia (Emperor). This was an easy job; one simply sat in the office and paid the Chinese "boys" (my particular "boy" was a grandmother) about 10 cents each for cocoons, and not too many of pavonia, please! I have found a few of these myself during my winter rambles. Now we all know how closely one must look to detect the exit hole from the cocoon of pavonia. The "boys" know this too, and should they find an empty cocoon a date stone is forced in and makes a good substitute for a chrysalis - but no Emperor ever came out of a date stone, so whoever bought that particular cocoon is a few cents out of pocket and that "boy" no savvy your English next time he calls. These "boys" are often very helpful. One instance I can recall. Strolling up the Blue Pool road, Hong Kong, I spotted a Humming bird Hawk Moth and snapped it into my killing bottle as it settled on a flower. A young Chinese fellow out pupae hunting saw me do this and made signs to me to follow him. He led me to a low tree near which I had rested a few moments before. Standing under the tree, with his back to the trunk, he pointed eagerly into the branches, saying "Ting how" (I may have spelt wrongly, but the expression, meaning "very good", sounds like that). For a full minute I scanned those [illegible] saw nothing. Then, as my sight become accustomed to the light a host of Lantern flies (those pretty chaps with the long snouts tipped with red like a blob of red sealing-wax) met my eager gaze. Always had I kept my open for these fellows but had never spotted one before. A sharp five minutes with the net gave me all I required, and the dollar I gave that boy was well spent.

I met another useful boy in a nullah on the side of High West mountain, the next mountain to Mount Victoria or the "Peak" and highest in Hong Kong, about 1,700 feet high. Only those who have tried "fly" catching on an [illegible] day in Hong Kong know how hot these nullahs can be at times, humid with a smell reminiscent of a steamy laundry. In this particular one could [illegible] (not always net) four different species of Swallowtails. [illegible] (a Brazilian butterfly, I believe); another was [illegible]. The [illegible] black and cream in colour I cannot name. This young fellow, obviously very poor, followed me about begging to use my net, a large one of [illegible] diameter but quite light. At last I gave him a trial and made him say [illegible] to catch and bring to me. He could net Swallow-tails alright, springing from boulder to boulder like a goat, but his idea of getting the capture out of the net was to put his head and arm inside and produce the butterfly, with a grin of delight, well crumpled and securely held by one or both wings. However, a little while of patient training (we could not understand a word each other said) and he would bring the net back to me, nicely folded over the rim. His biggest problem seemed to be to comprehend why, after much sweating to capture an insect I would let it go. These were damaged specimens, and no doubt he caught the same one more than once. We eventually became good chums. I used to write down his orders for next week-end or next time, and he would get the note translated at some school or mission. A dollar a day was his wage, being good pay for him and good value for me who used to keep fairly cool and much less tired.

But the end of April or early May saw me leave Hong Kong for the north of China and cooler climes. My captures in Hong Kong were [illegible], but as before related, when I left the big [illegible] I would leave my full store-boxes in safe keeping and take my [illegible] with me - all [illegible], I having never bought a date stone. [illegible] the great point was to leave them in a [illegible] for the [illegible] humidity relaxed one and all. [illegible] fireguarded electric radiator [illegible] and footwear [illegible] with green mould. [illegible] were stored in a [illegible] electric lamps burned constantly, and by this precaution kept all [illegible] in a perfectly dry condition. The wardrobe was well stocked with large slabs of camphor, and a chum who had to spend all his commission in Hong Kong Dockyard used to give it a daily inspection.

It was on the 1st of May 1933 I first landed at Wei Hai Wei, or, to be strictly correct on the isle of Lui Kung Tao. Here my heart went very low. For four days at sea I had been grieving over what I had left behind, as tropical heat and humidity do not bother me greatly. I had left an island of palaces, high mountains and lovely valleys, covered with semiptropical vegetation, where butterflies abounded everywhere. And also, when the time came for a little relaxation, there were find hotels, up-to-date shops, clubs, good picture-houses, dances, etc., and a warm climate. Now I found myself on a little island, which was practically just one small hill, mostly barren on one side, but well vegetated and pine-clad on the other. Hardly a bud or leaf on the trees, weather rather chilly, and all very rural. Not till Summer came was I to learn that this isle too was really warm and beautiful, and although one could walk around the island in about one and a half hours, there were many narrow path walks and plenty to see.

I lived in the Liu Kung Tao temple, which was used as a club. My home was a small cabin about 8 feet by 6 feet, with another similar cabin for use as a wardrobe and store room. Between these two cabins was an open space where, in warm weather, I took my meals if the mosquitoes were not too numerous. The outside cabin walls were white-washed, and little did I dream of the hundreds of moths I was to see on these walls during the two Summers I spent on this island. On my first arrival the only means of lighting after dark was by candle or oil lamp, but luckily my predecessors and the club members had arranged for me to obtain the necessary poles and wire to run an electric cable for about a mile and so tap into the switch-board of a small dynamo. This gave the club a few electric lights, the first being lit on the 21st June. And guess where. Not in my cabin, the bar or billiard room, but in the space between the cabins. I had visions, and they certainly did materialise far beyond my dreams. Soon after my arrival the weather warmed up appreciably, and in a week or so the island was green and all the life that sleeps through the Winter began to stir. Having failed to obtain any information about my hobby, except that there were plenty of butterflies and moths to be seen, I was left in anticipation of what treasures I might find. On the whole, the Butterflies were disappointing, yet they held one or two very pleasant surprises, including *P.machaon* and two other Swallowtails, *Pontia daplidice* (Bath White), *Colias hyale* (Pale Clouded Yellow), several hair-streaks, and other species, many British. From the foregoing, it may be gathered that to me, who has bred the great majority of our British Butterflies from the ova or larva, the Rhopalocera of the island, being very British and not too numerous in species, gave me little to get wildly excited over and was a little disappointing, especially as I failed to breed both *P.daplidice* and *C.argiades* (Short Tailed Blue).

I have a find large female specimen of *C.hyale*, which I keep because she was captured for me in a novel fashion. One lunch hour I noticed a large white butterfly fluttering on the end of a sunflower leaf in the garden of the club. As I had not met *P.brassicae* on the island, I went to get a closer view, and soon noticed that this butterfly was not acting in a natural manner. The trouble was that a Praying Mantis had caught the fluttering butterfly by the tail. The Mantis is a brave chap, and I admire him, but I also admired that huge female *C.hyale*. To my surprise he hung on whilst I stopped her flutterings and secured her by the thorax, and even then I had to clip him before he released his hold on the perfect specimen. Another Mantis incident took place outside my Office, where I saw a sparrow struggling in the path. The bird flew up for a few feet, dropped something and came down again for another scuffle in the dust. Naturally I dropped work to investigate. The would-be victim was a full grown female Mantis, and she was standing up to the sparrow, making lightning stabs at it with her long front legs. Only those who have handled these interesting insects know how strong and sharp that claw is on the front leg, and no doubt that sparrow had found this out too. The bird flew away on my arrival, and I picked up that Mantis, had her photo taken resting on my wrist, then put her in a place of safety to recuperate after her fight for life. The Praying Mantis is well worth watching when feeding. Almost every evening, when my cabin lamp attracted the moths and "stink" bugs to my window, a Mantis or two would come along and with one wild rush a "stink" bug or moth was his supper. They held their victims between those powerful forelegs and slowly devoured the wings before commening to eat the body. Watching one eat a "stink" bug (I know no better name) would make me feel sick.

They are about the size of a man's little finger nail, brown in colour, and [illegible] quite respectable. They used to fly about my cabin in dozens at times [illegible] one (one is enough!) and the wisest course is to clear off [illegible].

One hears some odd tales at times, and this one was told me by a Northern Chinese, [illegible] educated fellow, who spoke excellent English. He told it me [illegible] as a true story, but I could not then and cannot now believe it. On the island there were three ponds situated one above the other, the higher overflowing into the middle one and this in turn emptying into the lower one which drained into the sea. The middle one was a [illegible], on a quiet warm night I often used to sit and listen to the dozens of frogs croaking. On this particular day I had caught a large grass snake on my way to the office, and not wanting a snake, had thrown it into the pond to watch it swim and scatter the frogs. That night, near midnight, my lonely watch by the pond was disturbed by the Chinese fellow who was looking for me, bringing me a pair of moon moths. I casually mentioned the snake incident of the forenoon. This reminded my friend that years ago his father and he sat by this same pond in daylight and saw a snake catch and swallow a frog. As the snake was making for cover to digest its meal a large praying mantis attacked it. This Chinese swore that a Mantis can kill a snake by driving its claws into the snake's eyes, which this particular one did. Then, as the snake died, the frog came out of its mouth, saw the mantis, swallowed its rescuer and jumped back into the pond! That was my friend's story, and he stuck to it, but its tone is very suggestive of an old fable.

One interesting but neck aching job to be done before the buds on the trees burst was collecting the cocoons of *Philosamia* [illegible] silk moth). These cocoons were usually found hanging from the uppermost branches of trees, looking like dead leaves fluttering in the wind. The larva pupates by securing one or two leaves to a twig and forming its cocoon between them. I would procure a very long bamboo pole and secure a hooked piece of round iron bar to the thin end. This crude arrangement was adequate enough to break off the branch from which a cocoon was hanging, and a few hours' work would collect about 50 cocoons. The natives were always gleaning wood etc. for their winter fires, and I understood it was a punishable offence for them to break branches off trees or in any way to destroy the standing vegetation of the island. Being a foreigner there I acted "green", but never heard a complaint against my rather destructive practice. So I used to have a good following of youths who were helpful in spotting the cocoons, their reward being the branches. The cocoons were strung across my office and I used to give the moth a whiff of chloroform [illegible] dried off into perfect condition, and [illegible] formalin would kill it. I would keep a ready supply of [illegible] who might want a few butterflies and moths to take home from their commission as curios. I must have set and given away hundreds of "flies" [illegible] to fellows who were mildly interested but did not collect.

I always looked forward to the days when my Atlas Moths emerged. Although I had several dozen, there was never a really outstandingly sized specimen. My largest specimen spanned just over nine inches, but I am told that eleven inches is more the maximum span. (Probably *A. edwardsii* of India). I tackled them as the Arrindi and Tussch moths. My first attempt to kill the large moths was with a charge of formalin, but I found the insect very rigid and several days elapsed before it was supple enough to set without forcing the wings. Also they do take up a lot of room in a relaxing tin (one moth per tin!). I found the best method of killing was to soak a small piece of cotton wool in chloroform, secure the moth by the body under the wings and hold the wad to its head. It was unconscious in a few seconds, when it could be pinned and placed on a setting board with a freshly saturated chloroform wad at its head. It was set whilst supple, and one small charge of formalin injected so that it was dead beyond doubt.

A few words about the Cicala or Cicada may be of interest. [illegible] reader who has not seen this noisy insect I can only describe it as [illegible] like a huge housefly, heavily built, with powerful wings and [illegible] a man's thumb. With the coming of Summer came the Cicada [illegible] whistling noise reminded me, an engineer, of steam escaping [illegible] I detested them because their incessant whistling was in [illegible] seated in a hot office trying to juggle with figures and [illegible] offices were in a small temple, and one lonely high tree [illegible].

(To be continued)

ADVERTISERS' ANNOUNCEMENTS

This page is reserved for members' advertisements (not exchanges), dealers' notices, etc., at cheap rates. For advertising rates, apply to the ADVERTISING SECRETARY, Mr. A.N. BRANGHAM, 1c, HOWITT ROAD, BELSIZE PARK, LONDON, N.W.3. (Telephone number: PRImrose 6073). Advertising copy should be sent to Mr. Brangham by the 12th. of the month before the next issue of the Bulletin is published.

H.K. LEWIS & Co. Ltd.
PUBLISHERS & BOOKSELLERS.

SCIENTIFIC BOOKS

ENGLISH and FOREIGN books on the Biological Sciences can be supplied from stock, or obtained promptly to order.

CATALOGUES are issued, and will be sent post free on request.

SECONDHAND BOOKS in all branches of science are available at the Secondhand Department, 140, Gower Street. Catalogues and quotations on application.

LENDING LIBRARY

The Scientific Library lends books on the pure and applied sciences.

THE ANNUAL SUBSCRIPTION is from one guinea.

BOOKS may be retained as long, or exchanged as often as desired. New books and new editions are added as soon as published.

DETAILED PROSPECTUS will be sent post free on application.

H. K. LEWIS & CO. LTD., 136 GOWER STREET,
LONDON, W. C. 1.

PRINTING - Data labels, any wording, in 6 point Cheltenham or Cheltenham Bold type, 2/- per 250 alike. 3/6 per 500, 6/- per 1000. Saves much time in label-writing, and is far neater into the bargain. Specimen free on application.
BINDERS - For the Entomologists' Bulletin, Spring Back. Keeps Bulletins flat and protects them from dust or careless handling. Price 2/9, post free.
REPRINT - of the more important articles from Vol. I, now ready, over 40 pages long, price 2/-. Contains many useful hints and suggestions for collectors. Queries and replies Nos. 1 - 55 as well as other matter of interest to all entomologists. Let it complete your series of Amateur Entomologists' Society Bulletins.
DUPLICATING - Have your duplicate and desiderata lists duplicated by the Society. Rate: First 100 like sheets 2/6d. each succeeding 100 1/6d. Profits to the Duplicator Fund. Only clean, well-duplicated pages produced.
LET THE SOCIETY BENEFIT from your wants in these directions. Obtainable from J.E. Knight, Toftrees, Woodside Avenue, London, N.12.

You can ALWAYS obtain OVA, LARVAE, PUPAE,
and SET SPECIMENS
of British and Foreign Lepidoptera
Dogs, Birds, Cavies, Bees, Honey,
Cigarette Cards and Books (all subjects)
From:
"THE PALLINGER BUTTERFLY BREEDING FARM"
Head Office: "The Cottage", Cacham Road, London, W.3.
Telephone: ACOrn 3234.
Lists Free.
Discount given to members of the A.E.S. quoting their number.

ADVERTISING RATE FOR MEMBERS on this page is 3d per line. Please make use of it!

BOOK REVIEW.

The Dragonflies of the British Isles by Cynthia Longfield, F.R.E.S. (Warne, Wayside & Woodland Series, 7/6, 1937)

Outside the Lepidoptera it is rarely that the amateur student of any order of insects can obtain a really comprehensive book on the British representatives of his order, which combines the advantages of being non-technical and reasonably priced. The gap is admirably filled as far as the Dragonflies are concerned by this new work of Miss Longfield's, which should be in the library of every entomologist who is willing to let his interests stray beyond the boundaries of the Lepidoptera.

Like all the "Wayside & Woodland" Series the book is well illustrated by photographs of every species and by numerous excellent diagrams (probably much more useful in dealing with this order than the superficially more attractive photographs). There are also three plates at the end of the book giving photographs of the more common nymphs likely to be encountered. The text includes a key to species and chapters on life history, methods of collecting and classification from a somewhat more technical viewpoint than is adopted in the bulk of the book, which, of course, consists of descriptions of and remarks on the individual species. These descriptions are reasonably clear and easy to understand, though some of them would lose nothing by greater brevity. The remarks on distribution are pleasingly cautious - being confined to a mention of the Counties in which the respective species occur - but, much as one sympathises with Miss Longfield's oft-reiterated appeals to abstain from over-collecting the rarer species, one fears that they will meet with no more success than have similar appeals in the past - some people *must* collect everything they see, and no appeal to their better nature (if any) seems to have any effect.

The chief weakness of the book lies in the early chapters on life-history and collecting-methods. No mention is made of the pronymph stage in the life-history, which latter is described in quite a large number of words but in surprisingly little detail. A similar criticism applies to the chapter on collecting methods, in which the question of breeding is dismissed in startlingly few words, though ending with an exhortation to do as much breeding as possible. *How* to breed, however, is dismissed in a paragraph or so. The two or three pages early in the book which are occupied by a "pronouncing dictionary" of Latin and Greek names would be far better devoted to an extension of these two chapters. Exactly what the object of this "pronouncing dictionary" can be is beyond my comprehension. The amateur unwilling to learn Latin names even phonetically is certainly not going to trouble to learn their pronunciation, particularly when Miss Longfield presents him with a list of not always appropriate but in the main intelligible English names (materially different from those given by other authors) which he can employ. Still less will those of us who have used the Latin names for years alter our pronunciation of them at the behest of classical scholars of the "waynee weedee weekee" school!

In general, this tendency to dismiss the life-histories in only a little more space than is given to the pronunciation of the names, as well as altering good descriptive names like *Cordulegaster annulatus* to meaningless monstrosities like *C. boltonii* (though *that* is not Miss Longfield's fault) gives the first impression that the book is aimed at the mere collector and cataloguer than the biologist or ecologist, such as must be common among our members. But in point of fact the book is remarkably useful to both types, and I recommend it to all members of the A. E. S.

A. F. O'FARRELL.

oOo oOo oOo oOo oOo

EDITORIAL NOTE

Some months ago Mr. G. K. Hebbert sent a lengthy article on Natural Selection. Since the subject, one of absorbing interest, may appear a trifle technical to some readers, this is not being published for the present. The object of the article was to place before members the account of a non-believer in natural selction as an agency in the diminution in numbers of types of individuals less suited than others to their environment. Owing to certain wrong conclusions a long reply would be needed before argument could begin, a matter which the small space at our disposal forbids. In addition, it would necessitate the discussion of animals and plants outside the Insecta, and not strictly within our province. An excellent book "in reply" to Mr. Hebbert's propositions is "Mimicry in Butterflies" by Reginald Crundall Bunnett, F.R.S., published by the Cambridge University Press, 1915. Although to the expert certain modifications of the vi put forward therein might appear imperative, in the light of modern knowledge, there is no doubt that this volumn will present our correspondent with a fair idea of the attitude of mind he wishes to oppose.

B. A. C.

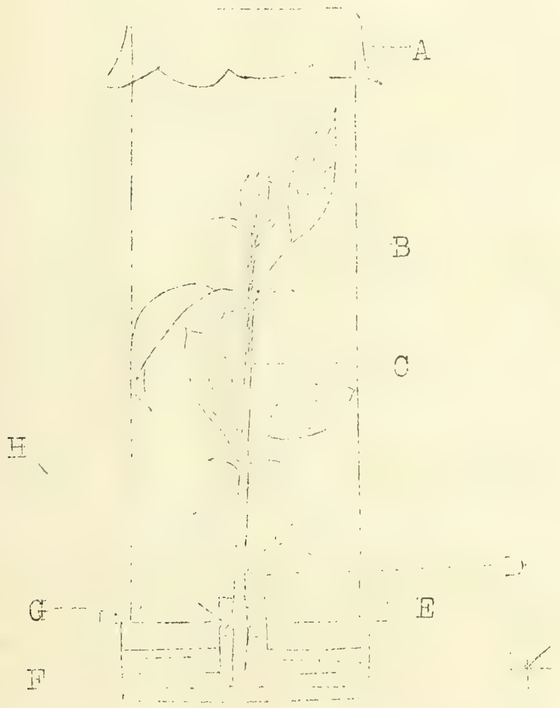
oOo oOo oOo oOo oOo

THE BOOTH MUSEUM COLLECTIONS. From October 18th to 22nd at Brighton an exhibition of Lepidoptera of the World was open to the public. This was but part of the large collections now housed in the Booth Museum, Dyke Road, Brighton, and it is hoped that members visiting Brighton will make a point of seeing what they can of these exhibits. They were admirably arranged by Major H. Blackiston, a very keen worker at the Museum, for whom members should ask if they wish to see any particular objects. Some remarkable polymorphic and mimetic forms of several species are among the collections, while foreign species intermediate or closely related to some of our British butterflies and moths give evidence of possible evolutionary trends, which it is quite impossible to observe in our own island insects alone. This suggests that such a series of closely related species would form an admirable showcase, details also being given on cards of differences and similarities in structure, life-history and distribution for comparative purposes. We must congratulate the people of Brighton on the enthusiasms shown by their libraries, museums and art galleries.

B. A. C.

oOo oOo oOo oOo oOo

A USEFUL BREEDING DEVICE.



A = fine gauze
B = glass gas chimney (6" x 1⅞")
C = food plant
D = glass or copper tube
E = round tin lid
F = tin holding water
G = blotting paper
H = cotton wool

J. E. Knight breeds a large number of his smaller larvae in the following rather unusual form of apparatus, undoubtedly an excellent contrivance.

One dimension of "F" should be greater than "E" so that air can circulate over the surface of the water through "F" and so avoid condensation inside the chimney. The food plant should be wedged in the tube with cotton wool. The blotting paper "G" enables young larvae to walk about easily, and part of the food plant should be arranged to touch it. The gauze "A" can be stuck on with glue or made detachable by finding a tin lid that just fits over the chimney, cutting the centre out of it and stretching gauze across. If the lid is too large, bind a layer of adhesive tape round the top of the chimney. A larger apparatus can be made using a [illegible] chimney with larger tins to [illegible].

If [illegible] unobtainable elsewhere [illegible] from the Society through Mr. Knight: gas chimneys 4d each, [illegible] 9d each, carriage extra.

oOo oOo oOo oOo oOo

QUERIES

Query No. 45 Have members noted any advantages or disadvantages in the use of "windolite" for breeding boxes as against glass or plain perforated zinc? The makers claim that it"lets through valuable ultra-violet rays", but at the same time claims are made that it "does not scorch". Presumably this latter remark means that it does not conserve heat, as does glass, in which case it would lose much of its effectiveness. Again, from a cursory examination, it appears that it would be porous to gases and therefore to water vapour, and so cut food-plant stems would tend to dry up speedily. Have members any observations to put forward?

B. A. C.

Query No. 46. Is it possible to breed many of the brilliant exotic species of lepidoptera, coleoptera, and other orders, in hot or cold greenhouses, or even in the open in Britain? What rules must be observed if they are to survive a change of food-plant, i.e. if a home bred generation is to thrive on a British relative of its natural food-plant? Again, what are the factors affecting the breeding of species from cool, dry climates in a wetter warmer atmosphere? In other words, in what different ways may change of food, atmosphere or sudden change of temperature effect an insect?

B. A. C.

oOo oOo oOo oOo oOo

REPLIES TO QUERIES

No. 8 The light tint is not necessarily due to the late emergence. I have one taken here on 23.V1.34 and one which was forced out on 18.iii.35.

T. Bainbrigge Fletcher.

No.17 It is impossible to answer this question without knowing the habits of the particular species concerned, but most egg-parasites are not confined to one host. Presumably, therefore, the Phalera parasites would attack other eggs available.

T. Bainbrigge Fletcher.

No.38 D. G. Sevastopulo, on page 113 of the September 1937 Entomologists' Record, notes that the vapour of methylated spirit is almost as rapid as the liquid itself for relaxing insects. Forty-eight is given as sufficient to relax and dry even large insects, this method avoiding any matting of hair on the abodmen as might be caused by the other method.

B. A. C.

No.43 The object of setting Insects, such as Lepidoptera, is not to make pretty specimens but to expand the wings so that any part of their structure can be examined. For this, flat setting has obvious advantages when the wings are to be examined under a lens or microscope. Convex setting, which is only used by English amateurs, seems to be a relic of the old days, a hundred years ago or more, when setting was done by means of triangular card braces, one brace being placed beneath the middle of each forewing, which made its upper surface more or less curved. When grooved setting-boards were adopted, the old style was retained aided by a popular prejudice to the effect that a flat-set specimen must be a "foreigner".

Low-style setting is also a relic of the early days of collecting. Its disadvantages are that low-set specimens are quite out of focus of a lens without removing the glass of a cabinet drawer, they provide no proper space for a legible label, and they are much more susceptible to cabinet pests. I am no believer in the use of a height varying with each size of pin or in pins of different lengths. My flat setting-boards are made to give one inch of pin below each insect; very small species, set lower on small pins, are staged to bring them to the same height. I need hardly add that no other collectors outside these Islands adopt the low style of setting.

T. Bainbrigge Fletaher.

T. Bainbrigge Fletcher, in a letter to B. A. Cooper, adds the following remarks:- "I don't see any necessity for using Continental pins, which are too long for English-made drawers. I use English pins (Tayler's No.16 Nickels for all ordinary specimens, No.20 for most Micros. and very small hand-made pins for minute ones - the smaller things being staged on pith and pinned in by No.16 white pins). My setting, an inch above point of pin, is not so high as the Continental system, but brings specimens well within range of a lens through the glass of a drawer, and one can still grasp the pin by the head, instead of having to grip it below the specimen, as one generally has to do with Continental pins. The low setting (English style) is a metter of habit - merely because most people start that way and the dealers supply board for that style - but it seems to me a bad habit, with nothing to commend it. The English style of storebox is also bad - made too hollow to take specimens on both sides; much better if made 4 ins. depp (instead of the usual 3); 4 ins. boxes not only have more room, but stand up better on a shelf without risk of toppling over. Everyone has, and prefers, his own methods. I see that you recommend ammonia for killing. I always use cyanide, but then I never kill thin-bodied species in the bottle - just stupefy them, then pin and give a pinch with the forceps and set at once. Noctuids, etc., if put into the bottle and left overnight are generally ready to set the next morning; if a little too stiff I put them into a relaxing tin until the day after to set. My tin is just a tobacco tin with a bit of clean rag wrung out in hot water, with a little naphthaline sprinkled on to avoid mould, and a bit of cellophane on top to keep the wings from contact with the moist rag. I always like to set things at once. Labels should be written at once and pinned on to the setting-board alongside the insect, but here one label will do temporarily below a series on one board if all have the same data.

Proper labelling is a subject which has to be driven into many collectors. Many do not bother to label at all; they think they will remember where and when specimens were taken, but after a bit they don't. Each specimen should have a label showing exactly where and when it was taken. If bred, the label should also indicate foodplant of larva, and if possible date of pupation and of emergence of insect. Empty pupa cases should also be kept and properly labelled. Parasites also".

No.44 Two larvae I had of Antherea roylei from Shantung spun a cocoon between them, one spinning the top part first, the other the lower. The shape of the cocoon was no different from others of the same species and no longer than a normal female cocoon. Both were males, but the lower one unfortunately emerged from the pupa first, and was unable to pass the other to reach the opening of the cocoon. The other emerged perfectly.

Ernest L. Bean (115)

oOo oOo oOo oOo oOo

WANTS & EXCHANGES

T.H.Fox (No.105) has for exchange pupae of Sphingidae; larvae of Lappet (G.quercifolia), Oak Eggar (L.quercus) and Scarlet Tiger (C.dominula); ova of Canary Shouldered Thorn (E.alniaria) and Pale Oak Eggar (T.crataegi). WANTED pupae of Pale Brindled Beauty (P.pedaria); larvae of Jersey Tiger (C.hera), Dark Tussock (D.fascelina), Cream Spot Tiger (A.villica) and others of special interest during the winter.

E.L.Bean (No.115) has pupae of Telea polyphemus, Philosamia cynthia, Platysamia cecropia and Hyperchiria io, all North American species.

W.N.Roberts (No.77) wishes to exchange a 2 inch and a 4 inch round type setting board for flat ones. They have a 13 inch base to fit a portable drying case, the corked length being 12¼ inches.

D.T.Lees-Smith (No.110) would like to hear from any boys who might like to receive butterflies from him next year when he is in Menano, in North Italy. He also wishes to receive in exchange Polyommatus astrarche var salmacis (Castle Eden Argus) and var. artaxerxes (Scotch Brown Argus).

Fumikiko Yano (No.38) hopes that more English members will write to him with a view to exchanging beetles or butterflies. Those who wish to exchange butterflies will find the book reviewed on P.77 (July number) that Mr. Yano so kindly sent us of great use, and it is hoped that this may stimulate in some a further interest in extra-British species.

P.Walden (No.102) wants larvae or pupae of fluctuosa (Satin Lutestring) and gonostigma (Scarce Vapourer). He offers larvae of smaragdaria (Essex Emerald), ova of apicaria (Bordered Beauty), and fine set specimens of machaon (Swallowtail butterfly).

J.Walker (No.22) has for exchange duplicates of Dianthoecia barrettii (Barrett's Marbled Coronet), Orrhodia rubiginea (Dotted Chestnut), Heliophobus hispidus (Beautiful Gothic), Aporophyla nigra (Black Rustic), Colias croceus (Clouded Yellow) and many other set British Lepidoptera, also larvae of Callimorpha hera (Jersey Tiger). WANTED Notodonta trilophus (Three Humped), Acronycta strigosa (Marsh Dagger), Bryophila algae (Tree-lichen Beauty), Bryophila muralis impar (Cambridge Marbled Green), Acosmetia caliginosa (Reddish Buff), Noctua depuncta (Dotted Clay), Noctua subrosa (Rosy Marsh Moth), Dianthoecia irregularis (Viper's Bugloss), Meliana flammea (Flame Wainscot) or Rhizotype flammea (Flame Brocade), Cucullia scrophulariae (Water Betony), Graptolitha furcifera (Conformist), Brachyonycha nebeculosa (Rannock Sprawler). He also wants large exotic butterflies, preferably in papers. He has large quantities of exotics in papers or set, and will exchange for others or foreign stamps.

A.F.Wingate (No.116) is especially interested in breeding the following:- Bombyx fortunatus, B.textor, Antherea mylitta, Attacus edwardsii, A.cynthia, Chinese Ailanthus, Daphnis nerii, Smerinthus quercus, Deilephila celerio, D.elpenor, [illegible], S. cecropia, Ceratocampa imperialis and Actias luna. He would like to hear from anyone who has successfully reared these (or to hear even book knowledge) and to know where these may be obtained.

Exchange Note: Wanted in numbers - Pierris brassicae (Large White), Agriotes lineatus (Common wireworm beetle) and many other species of economic insects and [illegible]. Offered in exchange - many local species of Lepidoptera and Coleoptera from the New Forest. - A.Ford, 42 Irving Rd., Bournemouth, (No.93)

oOo oOo oOo oOo oOo

MEMBERSHIP CHANGES

Newcomers:-

No.110 - D.F.Lees Smith, 1, Rutland Gardens, London, S.W.7. (Lepidoptera)
Letters until further notice to be sent to Hotel Savoy, Merano, Italy.

No 111 - P. Philipson, Limberlost, Ditchling, Sussex. (Lepidoptera)

No.112 - K. E. S. Colman, 4, Ashley Court, Frognal Lane, London, N.W.3 (Lepidoptera)

No.113 - Patrick Sands, c/o Mr. De Gent, 38, The Market, Gheel, Province of Antwerp, Belgium. (Lepidoptera).

No.114 - Philip H. Bolton, B.A., F.R.G.S., Abinger Hill, Holmbury St. Mary, nr. Dorking, Surrey. (Lepidoptera).

No.115 - E. L. Dean, 121, Queen's Road, West Croydon, Surrey (Lepidoptera, British and Foreign).

No.116 - A. F. Wingate, [illegible], Balmer Lawn, Brockenhurst, Hants. (British and Foreign Lepidoptera, especially Sphingidae and the larger Bombyces).

PRESENT TOTAL: 106

oOo oOo oOo oOo oOo

LIVING COCOONS

of large and handsome American and Indian silkmoths, including the giant Atlas moth (largest moths in the world) ....

Particulars from:- A. Ford, Entomologist, 42, Irving Road, Bournemouth, Hants.

JOINT MEETING OF THE
A.E.S. & ROYAL COLLEGE OF SCIENCE NATURAL HISTORY SOCIETY.

A Lecture Entitled
"[illegible] and Ecological Aspects of Entomology"
will be delivered by Major H. C. Gunton
at 5.15 p.m. on Friday, Jan.14th 1938

in the [illegible] of the Royal College of Science, Prince Consort Road, off Exhibition Road, South Kensington, S.W.7.

Buffet Tea in Elementary Laboratory (First Floot) at 4.45.

ALL ARE INVITED - BRING YOUR FRIENDS - Don't forget the date.

If you don't know the way, write to [illegible] Cooper.

oOo oOo oOo oOo oOo

BUTTERFLY HUNTING IN SWITZERLAND IN 1937.

I started in Lausanne where I had spent the winter. My first collecting ground was a big meadow by the Bois de Vaux tram terminus near the Lake of Geneva. There I took in April Pieris brassicae (Large White), P.rapae (Small Whit P.napi (green Veined White), Nymphalis io (Peacock) and N.urticae (Small Tortoiseshell). One day in the last week of April I went up to Chalet a Gobet by tram, 9 miles out of Lausanne. It is just a large inn on the edge of the Jorat Forest. I walked some way along the road and turned off to the left. As it was 2,700 feet above sea-level, the trees were still bare. There were plenty of Gonepteryx rhamni (Brimstone) but nothing else. In May most of my collecting was done in a large wood, the Bois du Chenacles, on the Lausanne-Belmont road. In a small clearing across a stone bridge I found Pieris brassicae (Large White), P.napi (Green Veined White), Gonepteryx rhamni (Brimstone), a rather bad specimen of Polygonia c-album (Comma), Argynnis dia (Weaver's Fritillary) and Nemeobius lucina (Duke of Burgundy Fritillary); Pararge megaera (Wall) was to be found on all the walls bordering the

Early one morning about 9.15, as I was keeping a look-out for lathonia I saw a large black butterfly with white in the middle of the wings flying around swiftly. It finally settled on a wall, bang by a manure heap (ugh!). I went up to look at it, and there, not a yard from my nose, was the famous under surface of pinkish-grey, with a broad white stripe in the middle of the hind wigg. As soon as I saw it, I howled with joy! Now, can any of you think what it was? Well, it was none other than the famous Purple Emperor, Apturus iris. I struck, but missed. It then settled on a leaf of a Buddleia bush. I struck again and the same thing happened. A third time I struck it flew off, and, describing a wide circle, shot off with wings outspread to a great height above the tallest oak in the neighbourhood, 50 yards away. This species is most difficult to capture, even the Swallowtail being dead easy in camparison. It drove me crazy to see another half-dozen Purple Emperors sailing around the above-mentioned oak.

In some marshy fields across the Rhine above Maienfeld, I found Melanargia galathea (Marbled White), Epinephele jurtina (Meadow Brown) and Coenonympha iphis. I mistook the females of the latter species for one of the many [illegible] of C.tiphon (Large Heath). In another locality (a big, grassy, steep slope [illegible] back of the town) I found Parnassius apollo, Colias croceus (Clouded Yellow), [illegible] paphia (Silver Washed Fritillary), A.adippe (High Brown Frit.), A.aglaia [illegible] Green Frit.), A.amathusia, Limenitis camilla (White Admiral), Melanargia [illegible]ea (Marbled White), Erebia ligea (Arran Brown), Epinephele jurtina (Meadow Brown) and Hesperia alveus.

On July 17th, I went to Leuk (Loeche) in the Rhone Valley on the Simplon railway. I would have liked to have stopped at Brig (Brigue) so that I could go over the Simplon Pass to Laquinthal, the only known locality of Erebia christii, a little butterfly very much like our own E.epiphron var.cassiope Small Mountain Ringlet). At Leuk I was astonished to find Papilio machaon (Swallowtail) and P.podalirius flying in the main street. That afternoon, I went up to Leukerbad (Loeche-les-bains) where I stayed for a week. On a grassy slope that late afternoon I found Parnassius mnemosyne, A.niobe (Niobe Fritillary), A.amathusia, Erebia epiphron var. cassiope, E. ceto, E.stygne, Coenonympha areania var. satyrion, Lysandra damon and Zizera semiargus (Mazarine Blue), together with Hesperia alveus. The next day I went to another place, this being covered with enormous boulders. Here I caught P.apollo, Colias chrysotheme, Argynnis niobe, Euvanessa antiopa Camberwell Beauty), Polygonia c-album (Comma), Erebia ligea, E.stygne, E.ceto, Coenonympha areania var.satyrion, Hesperia alveus and H.calcaliae. That afternoon, walking along the road from Leukerbad to Leuk I met Colias hyale (Pale Clouded Yellow), C.croceus (Clouded Yellow), Argynnis paphia (Silver Washed Frit.), A.adippe (High Brown Frit.), A aglaia (Dark Green Frit.), A.niobe, A.amathusia, Nymphalis io (Peacock), Erebia stygne, E.ligea, Hipparchia [illegible], H.cordula, H.semele Grayling), Plebius aegon (Silver Studded Blue), [illegible] icarus (Common Blue), Lysandra corydon (Chalk Hill Blue), L.damon, Zizera minima (Little Blue), Z.semiargus (Mazarine Blue), Hesperia alveus, H.calcaliae, Charcharodus althaeae and Augiades sylvanus (Large Skipper).

Six days later I went up to the Gemmi Pass, finding Parage hiera, a var. of Nomiades arion, Lysandra damon, L.corydon (Chalk Hill Blue). Erebia stygne, E.epiphron var cassiope (Small Mountain Ringlet), later above the refreshment hut Nymphalis urticae (Small Tortoiseshell) and Erebia tyndarus, while at the summit I caught Erebia stygne, and saw some Argynnis pales. The next day I went down to Leuk, and in a grossy hay-meadow I managed to catch Papilio machaon (Swallowtail), P.podalirius (Scarce Swallowtail), Pontia daplidice (Bath White), Colias hyale (Pale Clouded Yellow), C.croceus (Clouded Yellow) and Hipparchia cordula. That afternoon I went to Villars-sur-Bex, in the Vaudois Alps. There I got in a lucerne field species of the genera Colias, Pieris, Epinephele (except tithonus), Chrysophanus dorilis and Coenonympha pamphilus. In a mountain meadow Erebia stygne, E.manto and E.lappona were caught, while elsewhere I found all the Vanessidae.

D. T. LEES-SMITH (aged 15).

road from Chailly tram terminus to the bridge. In a place studded with large boulders on the Lausanne side of the bridge I got Colias hyale (Pale Clouded Yellow) - this was a very small specimen - Argynnis euphrosyne (Pearl Bordered Fritillary), Pyrameis cardui (Painted Lady), Pararge aegeria vars. aegerides and intermedia (Speckled Wood), P. megaera (Wall), Polyommatus icarus (Common Blue), Zizera minima (Little Blue), Z. semiargus (Mazarine Blue and Carterocephalus palaemon. The latter butterfly (Chequered Skipper) is rather rare in Switzerland, so I was lucky. Amongst the Common Blues which I took there was an interesting aberration without orange spots on the under-surfaces of both wings, this being ab. clara.

In the middle of May I went to Glion above Montreux. It was a beautiful day, the Jura Mountains and Geneva could just be seen, so could the Glacier du Trient (up the Rhone valley). Here, on a grassy slope I got Erebia medusa and the butterflies mentioned above. I saw Euvanessa antiopa (Camberwell Beauty) sailing gracefully along high up. I noticed that the borders were pure white. Just about 12 o'clock I saw what I thought was a large White. It looked so strange that I went down the slope to investigate. To my delight and astonishment it was none other than Papilio podalirius (Scarce Swallowtail). It was a fine specimen, too. Just as I was about to strike, it rose and flew on, but settled a yard ahead. I sneaked up and struck. When it was safe and sound in the cyanide bottle, I yelled with joy. On the 27th of May I went up to Chalet a Gobet again. This time the trees were out and Gorepteryx rhamni more abundant than ever. I got Euchlöe cardamines (Orange-tip), Leptosia sinapis (Wood White), Callophrys rubi (Green Hairstreak), Hesperia malvae (Grizzled Skipper), H. sao and Chrysophanus phlaeas.

On June 6th, I visited a small place called Eclepens; it is a station on the Lausanne-Yverdon railway. I visited this place for the purpose of getting larvae of Aptura iris (Purple Emperor). As I expected, I got none at all! As compensation, I caught a fine specimen of Aporia crataegi (Black Veined White) for my first specimen. Six days later I was there again, this time getting Papilio machaon (Swallowtail), Colias hyale (Pale Clouded Yellow), C. croceus (Clouded Yellow), Melitaea athalia (Heath Fritillary), M. cinxia (Glanville Fritillary), M. didyma (Twin-Spot Fritillary), Melanargia galathea (Marbled White) and some more Aporia crataegi (Black Veined White). On the cracked bed of a dried-up pond, I saw two Arashnia levana (Map Butterfly). I would have caught one of them if I hadn't tripped over a log embedded in the mud and scared it off. Epinephele jurtina (Meadow Brown) and Polyommatus icarus (Common Blue) abounded. On the 26th of June, I went to Ragaz, in Eastern Switzerland. It can be found on the map by following the railway from Chur (Coire) northwards. When I arrived it had been raining, and the day was still cloudy. The next day was a beautiful one, and as I found the fields marked on the map, I naturally went along to them! There I found Plebeius aegon (Silver Studded Blue) swarming, with a good sprinkling of Melanargia galathea (Marbled White), Aphantopus hyperanthus (Ringlet), Epinephele jurtina (Meadow Brown), Polyommatus icarus (Common Blue), Adopaea thaumas (Small Skipper), A. lineola (Essex Skipper) and Augiades sylvanus (Large Skipper), but, strangely enough, not a single Coenonympha pamphilus (Small Heath) was to be seen. It was the same in other localities visited, Villars-sur-Bex being an exception, but even then only a few specimens were noted. In the neighbourhood of a large quarry I found Parnassius apollo (this butterfly is found on rough grassy slopes throughout Central and Southern Europe and in the lowlands in Scandinavia), Colias hyale (Pale Clouded Yellow), C. croceus (Clouded Yellow), Aporia crataegi (Black Veined White), Argynnis paphia (Silver-washed Fritillary), A. adippe (High Brown Fritillary), A. aglaia (Dark Green Frit.), A. lathonia (Queen of Spain Frit.), A. ino, A. amathusia, A. euphrosyne (Pearl Bordered Frit.), A. dia (Weaver's Frit.), Melitaea athalia (Heath Frit.), M. cinxia (Glanville Frit.), M. didyma (Twin Spot Frit.), Polygonia c-album (Comma), Euvanessa antiopa (Camberwell Beauty) - 1 pupating larva - Nymphalis io (Peacock, larvae and imagines N. urticae (Small Tortoiseshell, larvae and imagines), Pyrameis cardui (Painted Lady, larvae and imagines), P. atalanta (Red Admiral), Melanargia galathea (Marbled White), Erebia ligea (Arran Brown), Hipparchia semele (Grayling), Pararge maera, P. aegeria var. aegerides (Speckled Wood), P. megaera (Wall), Aphantopus hyperanthus (Ringlet), Epinephile jurtina (Meadow Brown), Thecla w-album (White Letter Hairstreak, Zephyrus quercus (Purple Hairstreak), Chrysophanus dorilis, Plebeius aegon (Silver-Studded Blue), Polyommatus icarus (Common Blue), Lysandra coridon (Chalk Hill Blue), Cyniris argiolus (Holly Blue), Hesperia alveus, Nisoniades tages (Dingy Skipper), Adopaea thaumas (Small Skipper), A. lineola (Essex Skipper), Augiades sylvanus (Large Skipper) and Nomiades arion (Large Blue).

and,
g

ll
e
ked
ish-

n
a

e),

n
ing
s

e)

y
y
ing,
f-
n

ilus

ted.
ly
the
d

dere
vill
pa
gine

bled
,
thus
ir-
gon
lk

1967-8
②